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SURVEILLANCE REPORT STAGE I DISSECTED MOTOR/PROPELLANT  
MOTOR NUMBER 0012029(U) OGDEN AIR LOGISTICS CENTER HILL  
AFB UT PROPELLANT ANALYSIS LAB J A THOMPSON FEB 86

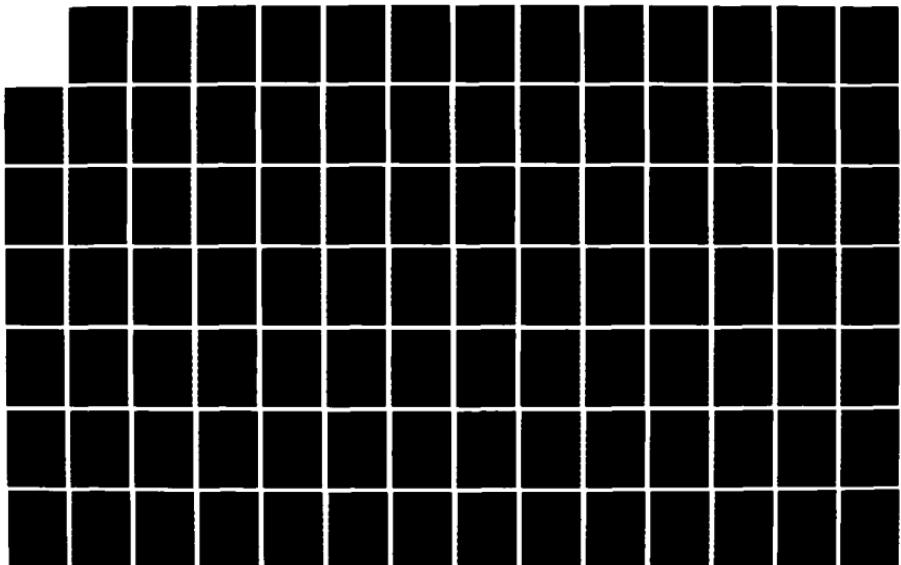
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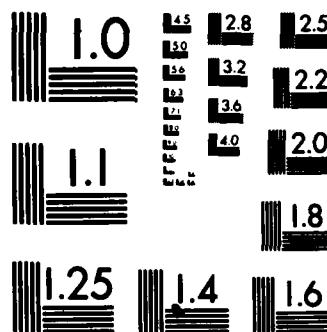
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SURVEILLANCE REPORT  
STAGE I  
DISSECTED MOTOR/PROPELLANT  
MOTOR NUMBER 0012029  
PHASE VI

PROPELLANT ANALYSIS LABORATORY

MAQCP REPORT NR  
515 (86)

February 1986

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SURVEILLANCE REPORT

STAGE I DISSECTED MOTOR 0012029

PHASE VI PROPELLANT & COMPONENT TESTING

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ABSTRACT

Testing was performed on First Stage Minuteman TP-H1011 propellant and case bond specimens from the dome end of motor S/N 0012029. This testing was performed to assure that deteriorations in motor physical and thermal properties could be detected in time to take corrective action before the system performance deteriorated below an acceptable level. Testing was accomplished in accordance with MMRBA Project M34929C.

From the analysis of the test results, the propellant and case bond properties have not deteriorated below an acceptable level at the present time and for two years beyond the oldest data point.



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## INTRODUCTION

### A. PURPOSE:

1. The test data in this report compiled with other laboratory data, flight test data, static firing data and engineering judgement is used to determine the useful shelf/service life for LGM-30 Stage I Rocket motors. The regression trend lines project aging trends two years beyond the last test data point.

2. This report contains test data, in the form of regression analysis, from dissected motor S/N 0012029. This is a LGM-30, Stage I, Wing II motor produced by Morton-Thiokol, Wasatch Division, on 63074.

3. Aerojet Strategic Propulsion Company (ASPC) dissected the motor and tested the bond specimens in 1980 (see Note). The data from ASPC is included in this report. The remaining case bond sections and TP-H1011 propellant were transferred to OO-ALC's Propellant Laboratory for storage, test, analysis of data and reporting. The test program used by the laboratory to test motor S/N 0012029 is contained in Table 1.

### B. HISTORICAL BACKGROUND:

1. ... May 1961, Thiokol began a three year LGM-30 Laboratory storage and test program to determine the rate of degradation from age for Stage I materials. During June 1962 and again in August 1963, additional samples were included in the program. New samples were added in July and August 1964 when the surveillance test program was extended to ten years (Test Plan 0717-62-0967, 53-8). The samples added to the inventory were considered to be a new population and were combined in regression analysis with the three dissected motors. STM-012 was a motor prepared by Thiokol Specifically for dissection, S/N 0012099 a SLIM motor and S/N 0012199 were selected from inventory for dissection. Propellant (TP-H1011) was tested

from all three motors and case bond specimens from two of the motors. STM-012 and S/N 0012199.

2. The dissected motors STM-012, 0012099 and 0012199 with dates of manufacture of 61221, 63166 and 63227 respectively, were dissected by Morton Thiokol. The assets were transferred to OO-ALC in 1967 for testing and reporting. This provides nearly twenty years of data for the original dissected motor testing.

3. By 1978, the dissected motor assets would only last three to four years except that propellant from motor S/N 0012199 was still available for future testing.

4. The decision was made to select a field motor for dissection in order to obtain TP-H1011 propellant and case bond specimens from the dome end. Motor S/N 0012029, manufactured in 63074, was selected for dissection and laboratory testing. From the propellant and case bond sections received from Aerojet, there is only propellant sufficient for two or three years of testing. Only one section of case bond is available for one year of testing.

5. Up to 1982, due to a limited number of dissected motor data, the data from all motors were combined for statistical analysis for the respective tests. In 1983, key LRSLA parameters were also reported for the individual motors. A statistical analysis (analysis of variance) was made to determine the statistical validity for combining the three dissected motor data. This analysis demonstrated that the data for the individual motors should not be statistically combined since they have been biased differently at some point in time.

NOTE: Aerojet Strategic Propulsion Company Report AUE-900-1, August 1980, Minuteman LGM-30 Stage I Motor S/N 0012029, Dissection and Material Test Analysis

C. DISCUSSION OF STATISTICAL TECHNIQUES:

The method used in this report to accomplish the statistical analysis is regression analysis. A successful analysis of data depends on a careful choice of the underlying mathematical model. The linear regression equation  $Y = a + bX$  was found to be the best fit model (out of 16 models tested) for this data. It yields the most significant "F" values for the data. If data are forced into a model which is inappropriate, it will yield less significant "F" values. In addition, the regression line will not be an accurate projection of the data. This line-fitting procedure assumes that the data are normally distributed and the means of these distributions are located about a line of least squares.

## STATISTICAL ANALYSIS

This report contains data and analysis for motor S/N 0012029. The analysis will be based on this motor only.

The testing of TP-H1011 propellant was consistently used for Stage I dissected motors. Therefore, a normal distribution population was assumed and the data from these motors were all statistically combined. In December 1983, MANPA Report Nr. 482(83), the data accumulated up to that time for each dissected motor was analyzed for motor-to-motor comparisons using the Analysis of Covariance. The results were that the data from these motors should not be statistically combined. Based on that analysis and coordination with Engineering, the individual motors have been reported separately.

The objective of this statistical analysis is to determine the effect aging has on Stage I propellant from Motor S/N 0012029. This analysis will assist Service Engineering in predicting Stage I serviceability.

The method used to accomplish this analysis was regression analysis. The linear equation  $Y = a + bX$  was found to be the best fit model for this data.

The sample sizes for each test age group used throughout the regressions can be found on the sample size summary which accompanies each plot. One disadvantage of plotting sample mean values, per age group, is the masking of individual sample points per age group.

The variance of data about each regression line is used to compute a tolerance interval such that 90% of the sample distribution will fall within this interval.

Since this was the first time motor S/N 0012029 was reported, mean value masking of individual values for tensile data was investigated. It was found

that out of 1230 tensile specimens tested, 3.25% were above or below the 90% band. This tolerance interval is extrapolated 24 months beyond the age of the last test date.

The 't' value and the significance of this statistic will be given as an indication of the "statistical significance" of the slope of the trend lines as it is compared to a line of zero slope. When a regression slope is labeled as significant, it should be noted that the slope of the trend line is significant from a statistical standpoint and a change over time is occurring. A significant indication does not necessarily mean that the change in test values obtained during testing is significant in regards to motor fleet operational performance.

The regression summaries can be found in table 2. From table 2 it can be observed the 64% of the regressions are significantly changing.

## TEST RESULTS

### A. UNIAXIAL TENSILE:

#### 1. Very Low Rate Tensile (0.002 in/min CHS, 180°F):

The strain at maximum stress, strain at rupture and modulus regressions show no significant trend line direction (figures 1, 3 and 5). The maximum stress and stress at rupture regressions show a statistically significant increasing trend line direction (figures 2 and 4).

#### 2. Very Low Rate Tensile (0.02 in/min CHS, 77°F):

The strain at maximum stress, strain at rupture and modulus regressions show no significant trend line direction (figures 6, 8 and 10). The maximum stress and stress at rupture regressions show a statistically significant increasing trend line direction (figures 7 and 9).

#### 3. Low Rate Tensile (0.2 in/min CHS, 77°F):

The strain at maximum stress regression does not show a significant trend (figure 11). The strain at rupture regression shows a statistically significant decreasing trend line direction (figure 13). Maximum stress, stress at rupture and modulus regressions show a statistically significant increasing trend line direction (figures 12, 14 and 15). The slope of the stress and modulus regressions is greater than expected and will be observed closely during the next test cycle.

#### 4. Low Rate Tensile (2.0 in/min CHS, 77°F):

The strain at maximum stress regression does not show a significant trend (figure 16). The strain at rupture regression shows a statistically significant decreasing trend line direction (figure 18). Maximum stress, stress at rupture and modulus show statistically significant increasing trend line directions that are greater than expected (figures 17, 19 & 20).

B. HYDROSTATIC TENSILE, JANNAF DOGBONES, 800 psig:

1. Hydrostatic Low Rate (2.0 in/min CHS, 77°F):

The strain at maximum stress, strain at rupture, maximum stress and stress at rupture regressions all show an increasing statistically significant trend line direction (figures 21 thru 24). The modulus regression does not show a significant trend (figure 25).

2. Hydrostatic Low Rate (20.0 in/minCHS, 77°F):

The strain at maximum stress regression shows a statistically significant increasing trend line (figure 26). The strain at rupture does not show a significant trend (figure 28). Maximum stress, stress at rupture and modulus regressions also show a statistically significant increasing trend line direction (figures 27, 29 and 30).

3. Hydrostatic Low Rate (2.0 in/min, 30°F):

The strain at maximum stress and strain at rupture regressions do not show a significant trend line direction (figures 31 and 33). The maximum stress, stress at rupture and modulus regressions show a statistically significant increasing trend line direction (figures 32, 34 and 35). The stresses and modulus slopes are greater than expected and will be monitored closely at the next test period.

4. Hydrostatic Low Rate (20.0 in/minCHS, 30°F):

The strain at maximum stress and strain at rupture regressions show a statistically significant decreasing trend line direction (figures 36 and 38). The maximum stress, stress at rupture and modulus regressions show a statistically significant increasing trend line direction (figures 37, 39 and 40).

C. BIAXIAL TENSILE, RAIL SPECIMENS:

1. Biaxial Very Low Rate Tensile (0.002 in/min CHS, 180°F):

The strain and stress regressions do not show significant trends

(figures 41 thru 44). The modulus regression shows a statistically significant increasing trend line direction (figure 45).

2. Biaxial Very Low Rate Tensile (0.02 in/min CHS, 180°F):

The strain at maximum stress and strain at rupture regressions show a statistically significant increasing trend line direction (figures 46 and 48). The maximum stress, stress at rupture and modulus regressions are not significant (figures 47, 49 and 50).

3. Biaxial Low Rate Tensile (0.2 in/min CHS, 77°F):

All of the regressions except modulus show a statistically significant increase in the trend line direction (figures 51 thru 54). The modulus regression does not show a significant trend (figure 55). The slopes of the stress regressions are greater than expected and will be monitored closely at the next test cycle.

4. Biaxial Low Rate Tensile (2.0 in/min CHS, 77°F):

The strain at maximum stress shows a statistically significant increase in trend direction (figure 56). The strain at rupture does not show a significant trend (figure 58). The maximum stress and stress at rupture regressions show statistically significant increasing trend lines (figures 57 and 59). The modulus regression does not show a significant trend (figure 60). When compared to other test parameters on Minuteman First Stage TP-H1011 propellant, these slope directions are statistically higher for this test.

D. TRIAXIAL TENSILE:

1. Low Rate Triaxial Tensile (2.0 in/min CHS, 800 psig, 30°F):

The strain regressions show a statistically significant decreasing trend line direction (figures 61 and 63). Maximum stress, stress at rupture and modulus regressions show a statistically significant sharp increase in the trend line direction (figures 62, 64 and 65).

2. Low Rate Triaxial Tensile (2.0 in/min CHS, 800 psig, 77°F):

All of the regressions show a statistically significant increasing trend line direction except modulus which does not show a trend (figures 66 thru 70).

3. Low Rate Triaxial Tensile (20.0 in/min CHS, 800 psig, 30°F):

The strain at maximum stress and strain at rupture regressions show a statistically significant gradual decrease in the trend line direction (figures 71 and 73). Maximum stress, stress at rupture and modulus regressions show a strong statistically significant rapid increase in the trend line direction (figures 72, 74 and 75).

4. Low Rate Triaxial Tensile (20.0 in/min CHS, 800 psig, 77°F):

The strain at maximum stress regression shows a statistically significant increase in the trend line direction (figure 76). The strain at rupture regression does not show a significant trend (figure 78). The maximum stress, stress at rupture and modulus regressions show a strong statistically significant sharp increase in the trend line direction (figures 77, 79 and 80).

E. TEAR ENERGY:

1. Very Low Rate Tear Energy (0.002 in/min CHS, 180°F):

The tear energy regression does not show a significant trend line direction (figure 81).

2. Very Low Rate Tear Energy (0.2 in/min CHS, 77°F):

This regression does not show a significant trend (figure 81).

3. Low Rate Tear Energy (0.2 in/min CHS, 77°F):

This regression shows a statistically significant increase in the trend line direction (figure 83).

4. Low Rate Tear Energy (2.0 in/min, 30°F):

This regression does not show a significant trend (figure 84).

5. Low Rate Tear Energy (2.0 in/min CHS, 77°F):

This regression does not show a significant trend (figure 85).

F. STRESS RELAXATION MODULUS:

All of the stress relaxation modulus regressions at 77°F do not show a significant trend (figures 86 thru 90). At 180°F, the 1000 and 10,000 second data do not show a significant trend (figures 94 and 95).

G. CASE BOND TENSILE (0.002 in/min, 180°F):

The case bond tensile regression shows a statistically significant decreasing trend line direction (figure 96).

H. THERMAL COEFFICIENT OF LINEAR EXPANSION (TCLE), (-120°C to 0°C):

1. Glass Point:

The glass point regression shows a statistically significant gradual increase in the slope of the trend line (figure 97).

2. TCLE Below T<sub>g</sub>:

This regression shows a statistically significant gradual increase in the trend line direction (figure 98).

3. TCLE Above T<sub>g</sub>:

This regression shows a statistically significant rapid increase in the trend line direction (figure 99).

## DISCUSSION OF TEST RESULTS

1. A statistically significant trend is shown in 66% of the tensile data. Most of these regressions show a statistically significant gradual change in the trend line direction.
2. Some of the regressions show a statistically significant rapid increase in tensile strength and modulus.
3. Although most of the regressions have a statistically significant trend line, the change in propellant physical properties, with respect to age, are moderate and no operational problems are expected at this time.
4. A gradual increase is seen in the glass transition temperature ( $T_g$ ) and in the TCLE below  $T_g$ . A statistically significant rapid increase is shown in TCLE above the  $T_g$  as the propellant ages.
5. For those regressions where statistically significant trends are seen, most of the changes are gradual. The same general trend is seen in block propellant and other dissected motor test data. The propellant regressions show less strain capability and higher tensile strength as the age increases.
6. For the case bond tensile testing, the regressions shows a fairly rapid decrease in tensile strength with age.

## CONCLUSIONS AND RECOMMENDATIONS

### A. CONCLUSIONS:

The test results show, under present storage conditions, most of the physical and thermal properties of the propellant along with the case bond test results indicate statistically significant aging trends. Some of the stress and modulus regressions that showed a statistically significant change had trend lines greater than expected.

However, the corresponding strain curves do not substantiate the rapid increase in stress and modulus trends. This trend maybe attributed to a change in test techniques, test operators or in test equipment set-up. Although the concern is not as great at this time due to the limited tests performed to date, additional testing should be performed immediately to assist in verifying the current trend. In addition, physical tests such as hardness, density, and crosslink density should be performed to complement and verify the stress and modulus trends.

### B. RECOMMENDATIONS:

It is recommended that testing be performed immediately on propellant from motor S/N 0012029. In addition, another motor should be selected, as soon as possible, for dissection and testing to confirm that the changes observed are not indicative of an operational problem.

TABLE 1  
TEST PROGRAM

CASE BOND - DOME END  
Section G

<u>Test</u>	<u>Conditions</u>	<u>Configuration</u>	<u>GO85 Spec Code</u>	<u>Spec Per Cond</u>	<u>Total Number of Spec</u>	<u>Test Meth</u>
Case Bond Constant Rate Tensile	180° F, 0 psig 0.002 in/min	Poker Chip see Fig 1	CG	12	12	A
Case Bond Constant Rate Shear	180° F, 0 psig 0.002 in/min CHS	Poker Chip with 22° Groove	CH	12	12	B
<b>PROPELLANT SECTION 3, AREA G</b> All Temperatures $\pm$ 2° F						
Stress Relax Modulus	77 + 180° F, 0 psig, 3% Strain, to 10,000 sec	JANNAF 1/2" Wood End Tab Dogbones, see Figure 3	TW	9	18	C
Tear Energy	30° F, 0 psig 2 in/min CHS	Tear Spec see Fig 4	TS	9	9	D
Tear Energy	77° F, 0 psig 0.2 + 2.0 in/min CHS	Tear Spec see Fig 4	TS	9	18	D
Tear Energy	180° F, 0 psig 0.002 + 0.02 in/min CHS	Tear Spec see Fig 4	TS	9	18	D
Low Rate Hydrostatic	30° F + 77° F 800 psig, 2.0 + 20.0 in/min CHS	JANNAF Dogbone	JA	9	18	E
Low Rate Tensile	77° F, 0 psig 0.2 + 2.0 in/min CHS	JANNAF Dogbone	JA	9	27	F
Very Low Rate Tensile	180° F, 0 psig 0.0002 in/min CHS	JANNAF Dogbone	JA	9	27	F
Triaxial Low Rate	30 to 77° F, 800 psig, 2.0 + 20.0 in/min CHS	3/4" GL Rail End Bonded see Fig 5	JD	9	18	H
Biaxial Low Rate	77° F, 0 psig, 0.2 + 2.0 in/min CHS	3/4" GL Rail End Bonded, see Fig 5	JD	9	18	H

TABLE 1 (cont)

<u>Test</u>	<u>Conditions</u>	<u>Configuration</u>	<u>G085 Spec Code</u>	<u>Spec Per Cond</u>	<u>Total Number of Spec</u>	<u>Test Meth</u>
Biaxial Very Low Rate	180 <sup>0</sup> F, 0 psig, 0.02 to 0.002 in/min CHS	3/4" GL Rail End Bonded see Fig 5	JD	9	18	H
TCLE*	5 <sup>0</sup> C rise/min	0.200" wafer (about 16 sq in)	WR	9	9	I

\*One package of wafers will be delivered to the laboratory and the specimens will be cut from the wafers.

TABLE 2  
REGRESSION TREND LINE SUMMARY

<u>TENSILE</u>	<u>X-HEAD SPEED</u>	<u>Sm</u>	<u>em</u>	<u>er</u>	<u>Sr</u>	<u>E</u>
Very LR, 180°F	0.002	S(+)	NS	NS	S(+)	NS
LR 77°F	0.02	S(+)	NS	NS	S(+)	NS
LR 77°F	0.2	S(+)	NS	S(-)	S(+)	NS
LR 77°F	2.0	S(+)	NS	S(-)	S(+)	S(+)
LR Hyd 800psi 77°F	2.0	S(+)	S(+)	S(+)	S(+)	NS
LR Hyd 800psi 77°F	20.0	S(+)	S(+)	NS	S(+)	S(+)
LR Hyd 800psi 30°F	2.0	S(+)	NS	NS	S(+)	S(+)
LR Hyd 800psi 30°F	20.0	S(+)	S(-)	S(-)	S(+)	S(+)
VERY LR BIAX 180°	0.002	NS	NS	NS	NS	S(+)
VERY LR BIAX 180°F	0.02	NS	S(+)	S(+)	NS	NS
LR BIAXIAL 77°F	0.2	S(+)	S(+)	S(+)	S(+)	NS
LR BIAXIAL 77°F	2.0	S(+)	S(+)	NS	S(+)	NS
LR TRIAX800psi 30°F	2.0	S(+)	S(-)	S(-)	S(+)	S(+)
LR TRIAX800psi 77°F	2.0	S(+)	S(+)	S(+)	S(+)	NS
LR TRIAX800psi 30°F	20.0	S(+)	S(-)	S(-)	S(+)	S(+)
LR TRIAX800psi 77°F	20.0	S(+)	S(+)	NS	S(+)	S(+)
TEAR ENERGY 180°F	0.002	NS				
TEAR ENERGY 180°F	0.02	NS				
TEAR ENERGY 77°F	0.2	S(+)				
TEAR ENERGY 30°F	2.0	NS				
TEAR ENERGY 77°F	2.0	NS				
STRESS RELAXATION	<u>10-SEC</u>	<u>50-SEC</u>	<u>100-SEC</u>	<u>1000-SEC</u>	<u>10000-SEC</u>	
3% STRAIN						
77°F 0 psi	NS	NS	NS	NS	NS	
120°F 0 psi	NS	NS	NS	NS	NS	
180°F 0 psi	S	S	S	NS	NS	
CAS BND TENSILE 180°F 0.002		S(-)				
<u>TCLE</u>	GP	S(+)				
	B/GP	S(+)				
	A/GP	S(+)				

NS= Non-significant trend line from a line of zero slope

+ = Significant slope in a positive direction

-- = Significant slope in a negative direction

NOTE: All testing performed at the 5% significance level.

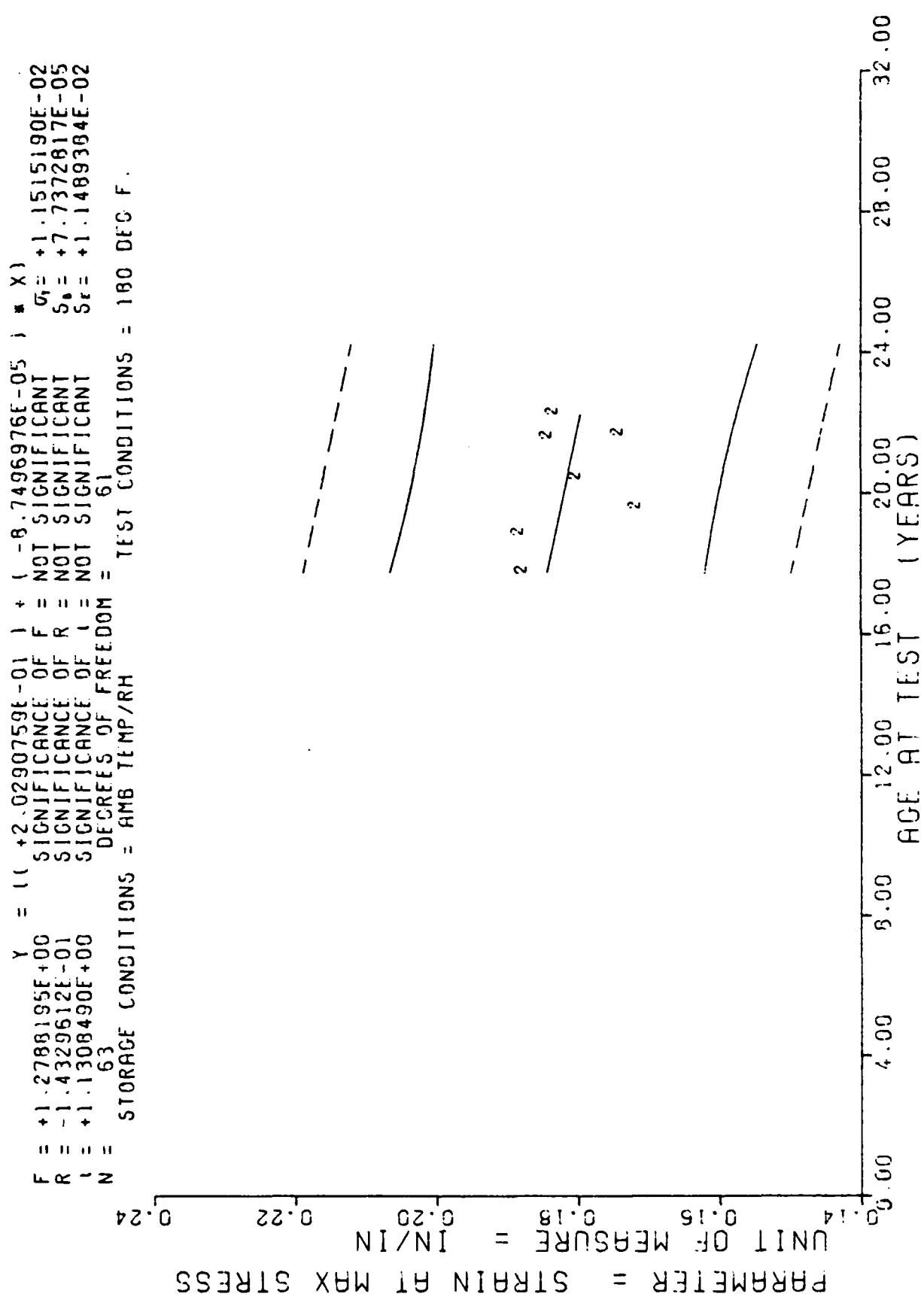


Figure 1

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

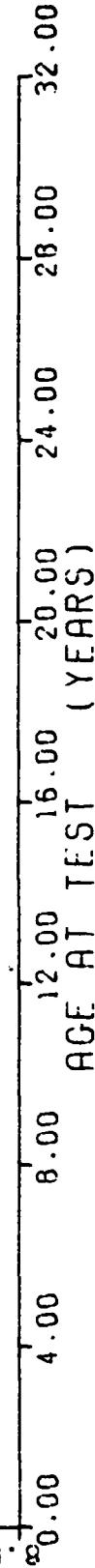
\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+1.8724417E-01	+6.8398165E-03	+1.6599597E-01	+1.7799997E-01	+1.8427967E-01
226.0	9	+1.8775534E-01	+8.5869077E-03	+1.9839596E-01	+1.7199999E-01	+1.8313324E-01
235.0	8	+1.7124974E-01	+8.5525524E-03	+1.8499554E-01	+1.6099995E-01	+1.8234574E-01
245.0	9	+1.67973315E-01	+6.7401358E-03	+1.6911958E-01	+1.6979998E-01	+1.8147081E-01
259.0	11	+1.8372690E-01	+1.2811388E-02	+2.0799594E-01	+1.6799998E-01	+1.8024587E-01
260.0	6	+1.7366659E-01	+6.2824122E-03	+1.8199598E-01	+1.6399997E-01	+1.8015837E-01
267.0	11	+1.6288159E-01	+1.5908465E-02	+2.0869597E-01	+1.6529995E-01	+1.7954587E-01

STAGE 1 DISSECTED MOTOR=0012029. VERY LOW RATE CH==.002 IN/MIN. STRAIN MAX STRS

$Y = 11 + 1.9825489E+00$   $1 + 1.9669055E-02$   $1 * X1$   
 $F =$  SIGNIFICANCE OF  $F =$  SIGNIFICANT  
 $R =$  SIGNIFICANCE OF  $R =$  SIGNIFICANT  
 $1 =$  SIGNIFICANCE OF  $1 =$  SIGNIFICANT  
 $N =$  DEGREES OF FREEDOM = 61  
 $63$   
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 100 DEG F.

PARAMETER = MAXIMUM STRESS  
UNIT OF MEASURE = PSI  
0.00 16.00 24.00 32.00 40.00 48.00



STAGE 1 DISSECTED MOTOR=0012029, VERY LOW RATE CHS=.002 IN/MIN, MAX STRESS

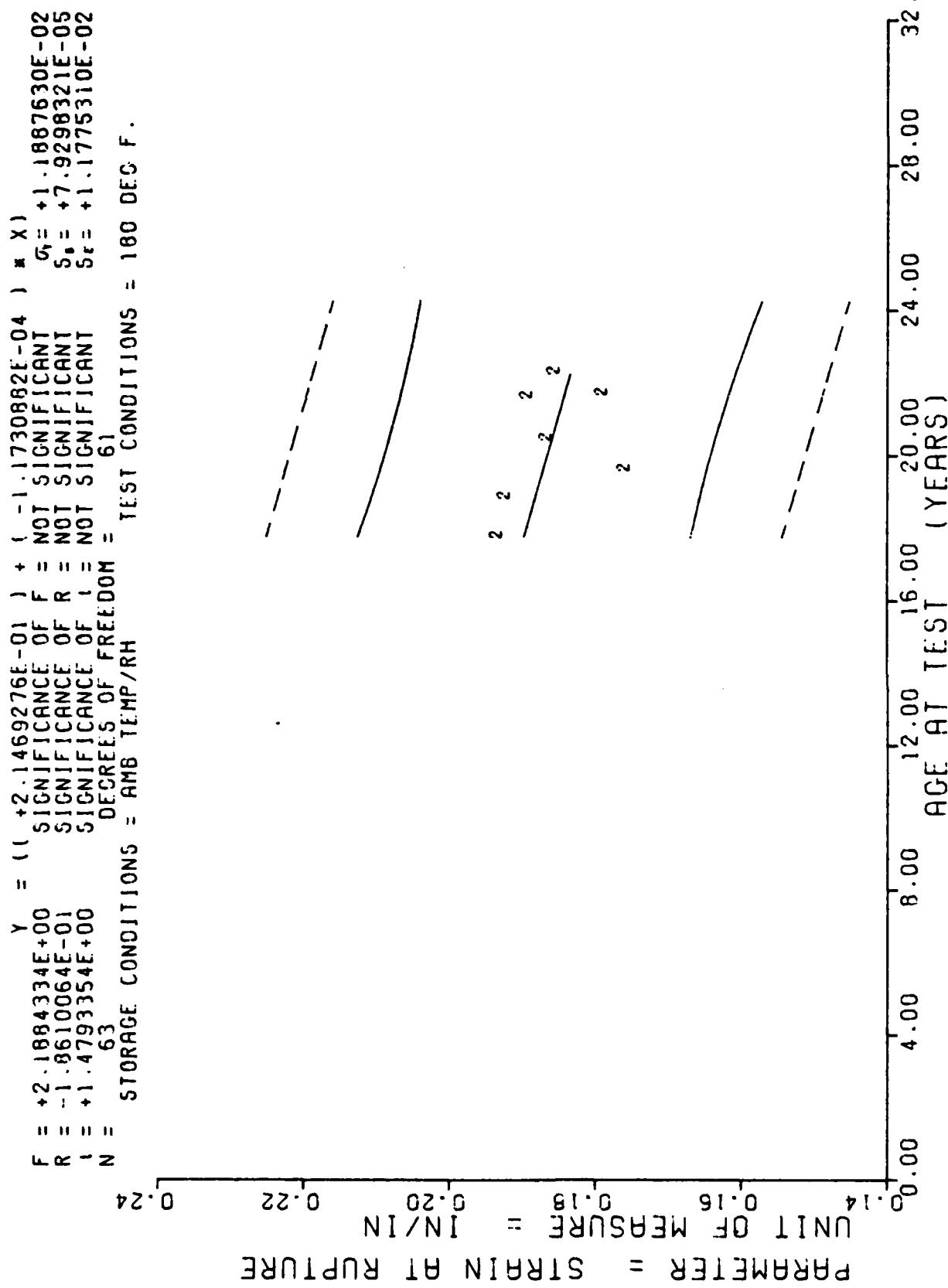
Figure 2

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION Y	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+2.1023315E+01	+1.1529172E+00	+2.2605585E+01	+1.9099990E+01	+2.1082046E+01
226.0	9	+2.1616653E+01	+5.1446395E-01	+2.2599590E+01	+2.1029998E+01	+2.2247741E+01
235.0	8	+2.4533737E+01	+1.3068543E+00	+2.6679552E+01	+2.2019992E+01	+2.3054763E+01
245.0	9	+2.1502212E+01	+6.5237952E-01	+2.2439587E+01	+2.0359985E+01	+2.3951461E+01
259.0	11	+2.5963592E+01	+2.4372010E+00	+2.9099590E+01	+2.1899993E+01	+2.5206832E+01
260.0	6	+3.2466659E+01	+9.6854832E-01	+3.3500000E+01	+3.0899993E+01	+2.5296493E+01
267.0	11	+2.2749084E+01	+6.5324371E-01	+2.3789593E+01	+2.1239990E+01	+2.5924179E+01

STAGE 1 DISSECTED MCTOR=0012029. VERY LOW RATE CHS=.002 IN/MIN.MAX STRESS



STAGE 1 DISSECTED MOTOR=0012029, VERY LOW RATE CHS=.002 IN/MIN, STRAIN AT RUPT.

Figure 3

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+1.52821575E-01	+6.5016781E-03	+1.999598E-01	+1.8299996E-01	+1.8970596E-01
226.0	9	+1.917535E-01	+8.9185366E-03	+2.0599597E-01	+1.7699998E-01	+1.8818092E-01
235.0	8	+1.753744E-01	+9.6682279E-03	+1.9099598E-01	+1.6599994E-01	+1.8712514E-01
245.0	9	+1.8607753E-01	+7.3594726E-03	+1.9469554E-01	+1.7509996E-01	+1.8595206E-01
259.0	1.1	+1.8872690E-01	+1.3278687E-02	+2.1399598E-01	+1.7199999E-01	+1.8430978E-01
260.0	6	+1.7845581E-01	+6.5364201E-03	+1.8699595E-01	+1.7099994E-01	+1.8419241E-01
267.0	1.1	+1.6502682E-01	+1.6230159E-02	+2.1199595E-01	+1.6709955E-01	+1.8337130E-01

STAGE 1 DISSECTED MOTOR=0012029. VERY LOW RATE CH2=0.002 IN/MIN. STRAIN AT RUPT.

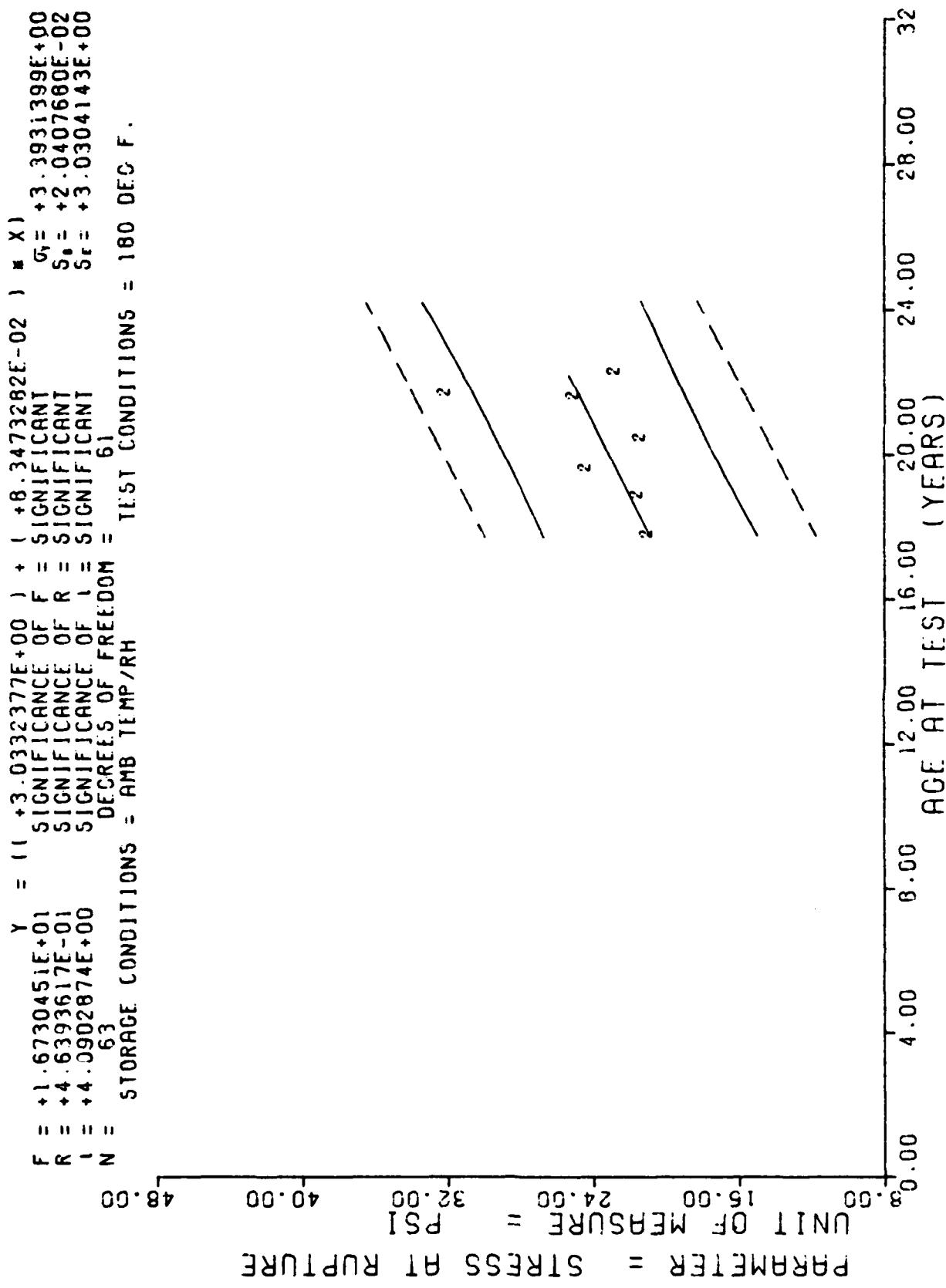


Figure 4

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+2.075554E+01	+1.2159443E+00	+2.2500000E+01	+1.87999987E+01	+2.0813034E+01
226.0	9	+2.11096E+01	+5.0124319E-01	+2.2199996E+01	+2.0699996E+01	+2.1898193E+01
235.0	8	+2.4162490E+01	+1.3564183E+00	+2.6355593E+01	+2.2500000E+01	+2.2649444E+01
245.0	9	+2.1151092E+01	+6.0876041E-01	+2.2019589E+01	+2.011995E+01	+2.3484176E+01
259.0	11	+2.4836334E+01	+2.4432881E+00	+2.8000000E+01	+2.0599990E+01	+2.4652816E+01
260.0	6	+3.1855593E+01	+7.6118643E-01	+3.2899593E+01	+3.0699956E+01	+2.4736282E+01
267.0	11	+2.2561758E+01	+6.5805207E-01	+2.3599550E+01	+2.0989990E+01	+2.5320602E+01

STAGE 1 DISSECTED MCTOR=0012029, VERY LOW RATE CHSE=.002 IN/MIN, STRESS AT RUPT.

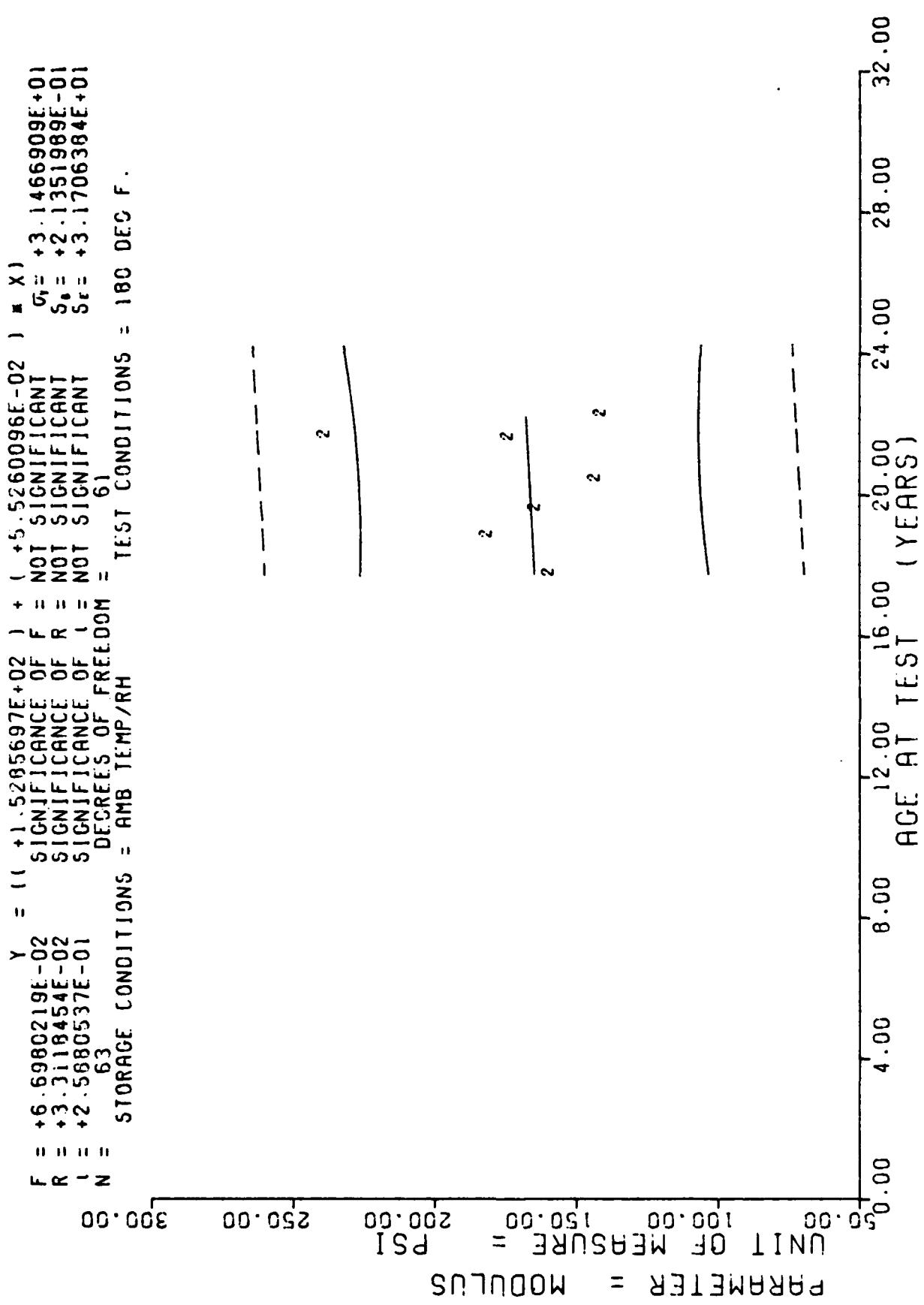


Figure 5

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION Y	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+1.6811109E+02	+8.0846218E+00	+1.6700000E+02	+1.4400000E+02	+1.6462736E+02
226.0	9	+1.75E8888E+02	+1.8684515E+01	+2.0900000E+02	+1.5400000E+02	+1.6534574E+02
235.0	8	+1.6200000E+02	+1.7614528E+01	+1.8900000E+02	+1.3800000E+02	+1.6584309E+02
245.0	9	+1.4177777E+02	+5.2862505E+00	+1.4900000E+02	+1.3600000E+02	+1.6639569E+02
259.0	11	+1.724E454E+02	+2.415E180E+01	+2.0400000E+02	+1.4800000E+02	+1.6716932E+02
260.0	6	+2.371E665E+02	+1.406E2953E+01	+2.5100000E+02	+2.1100000E+02	+1.6722459E+02
267.0	11	+1.358181817E+02	+1.6815577E+01	+1.6400000E+02	+1.1100000E+02	+1.6761140E+02

STAGE 1 DISSECTED MOTOR=0012029. VERY LOW RATE CHSE=0.002 IN/MIN. MODULUS

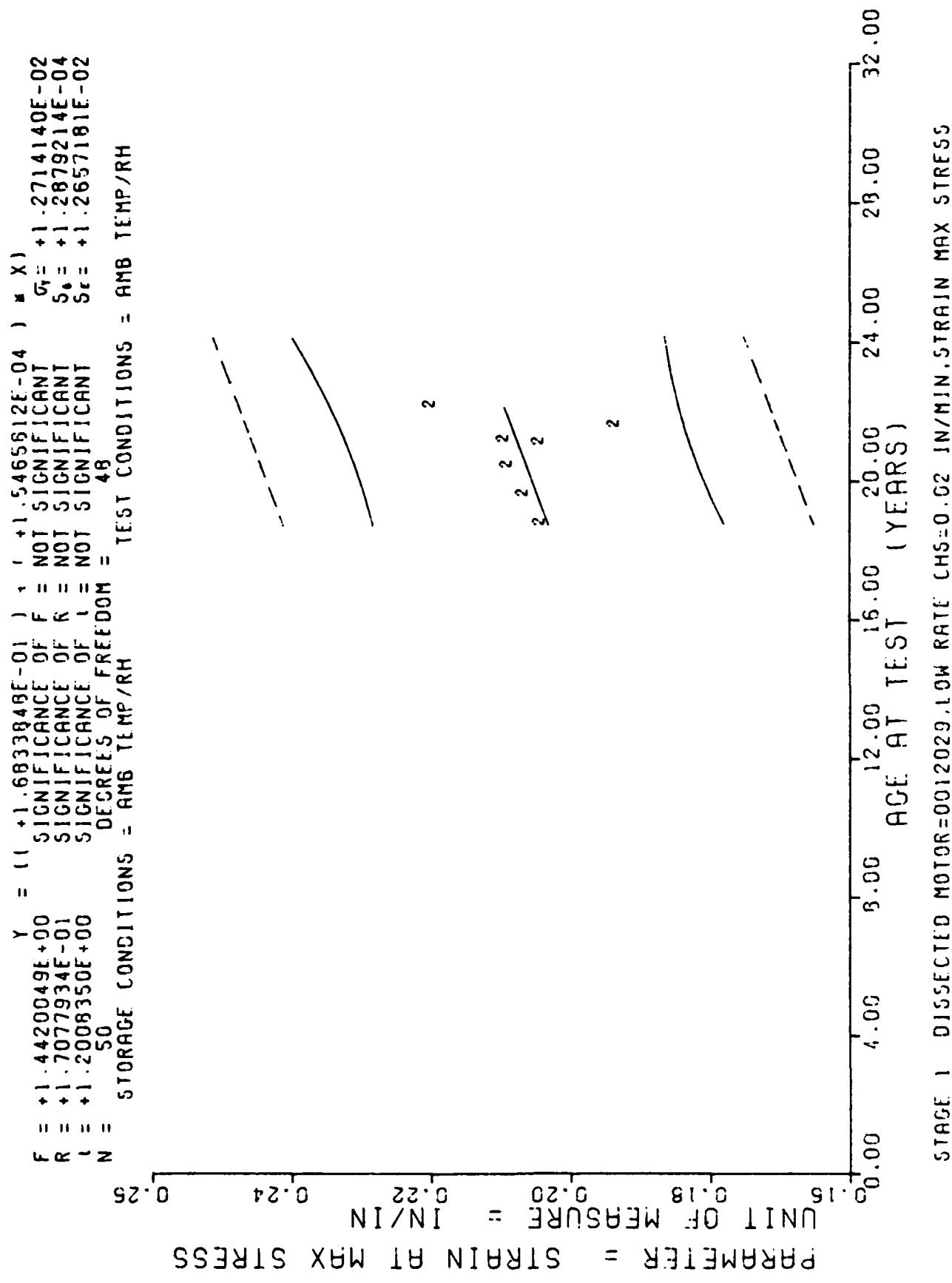


Figure 6

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
225.0	8	+2.0375584E-01	+6.6975515E-03	+2.1829598E-01	+1.9579994E-01	+2.0313656E-01
235.0	8	+2.0624971E-01	+1.8032326E-02	+2.2499596E-01	+1.7459994E-01	+2.0468312E-01
245.0	9	+2.0847743E-01	+5.5115776E-03	+2.1729599E-01	+1.9899994E-01	+2.0622968E-01
253.0	7	+2.0556545E-01	+8.3764565E-03	+2.1539598E-01	+1.9399994E-01	+2.0746695E-01
254.0	2	+2.0899933E-01	+1.6556939E-02	+2.1999596E-01	+1.9799995E-01	+2.0762163E-01
259.0	7	+1.9314259E-01	+1.2498E69E-02	+2.0799594E-01	+1.8099999E-01	+2.0839488E-01
266.0	9	+2.1951067E-01	+8.2907318E-03	+2.2619598E-01	+1.9909995E-01	+2.0947754E-01

STAGE 1 DISSECTED MOTOR=0012029,LOW RATE CHS=0.02 IN/MIN,STRAIN MAX STRESS

$F = +9.7856671E+00$        $Y = 11 + 6.8080490E+01$        $! + 6.1946929E-02$        $! * X_1$   
 $R = +4.1151800E-01$       SIGNIFICANCE OF  $F =$  SIGNIFICANT       $\sigma_1 = +2.1133944E+00$   
 $I = +3.1282370E+00$       SIGNIFICANCE OF  $R =$  SIGNIFICANT       $S_1 = +1.9802504E-02$   
 $N = 50$       SIGNIFICANCE OF  $I =$  SIGNIFICANT       $S_2 = +1.9461117E+00$   
 $DEGREES OF FREEDOM = 48$   
 $STORAGE CONDITIONS = AMB TEMP/RH$       TEST CONDITIONS = AMB TEMP/RH

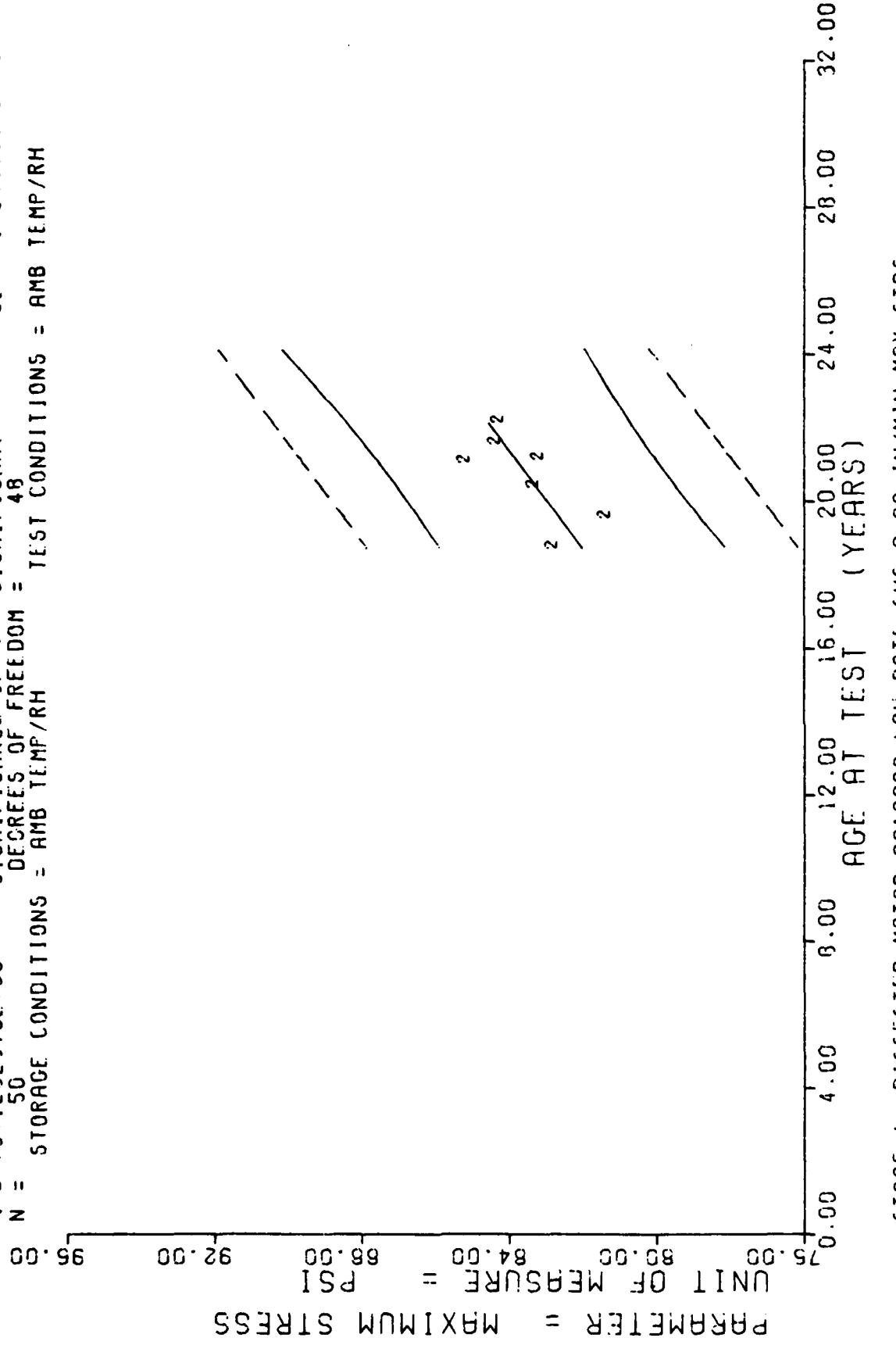


Figure 7

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
225.0	8	+8.2711181E+01	+1.5461941E+00	+8.4049587E+01	+7.9177992E+01	+8.2018539E+01
235.0	8	+8.1294921E+01	+2.6649735E+00	+8.6379589E+01	+7.6829986E+01	+8.2638015E+01
245.0	9	+8.3226775E+01	+6.6755541E-01	+8.4279559E+01	+8.2259994E+01	+8.3257476E+01
253.0	7	+8.5095626E+01	+9.2578101E-01	+8.6679592E+01	+8.4179992E+01	+8.3753951E+01
254.0	2	+8.3085596E+01	+2.7865545E-01	+8.3289553E+01	+8.2899969E+01	+8.3815002E+01
259.0	7	+8.4257034E+01	+3.0458393E+00	+8.7299587E+01	+7.9799987E+01	+8.4124740E+01
266.0	9	+8.4178817E+01	+1.1354390E+00	+8.5529598E+01	+8.2569992E+01	+8.4558364E+01

STAGE 1 DISSECTED MOTOR=0012029, LOW RATE CHS=0.02 IN/IN, MAX STRS.

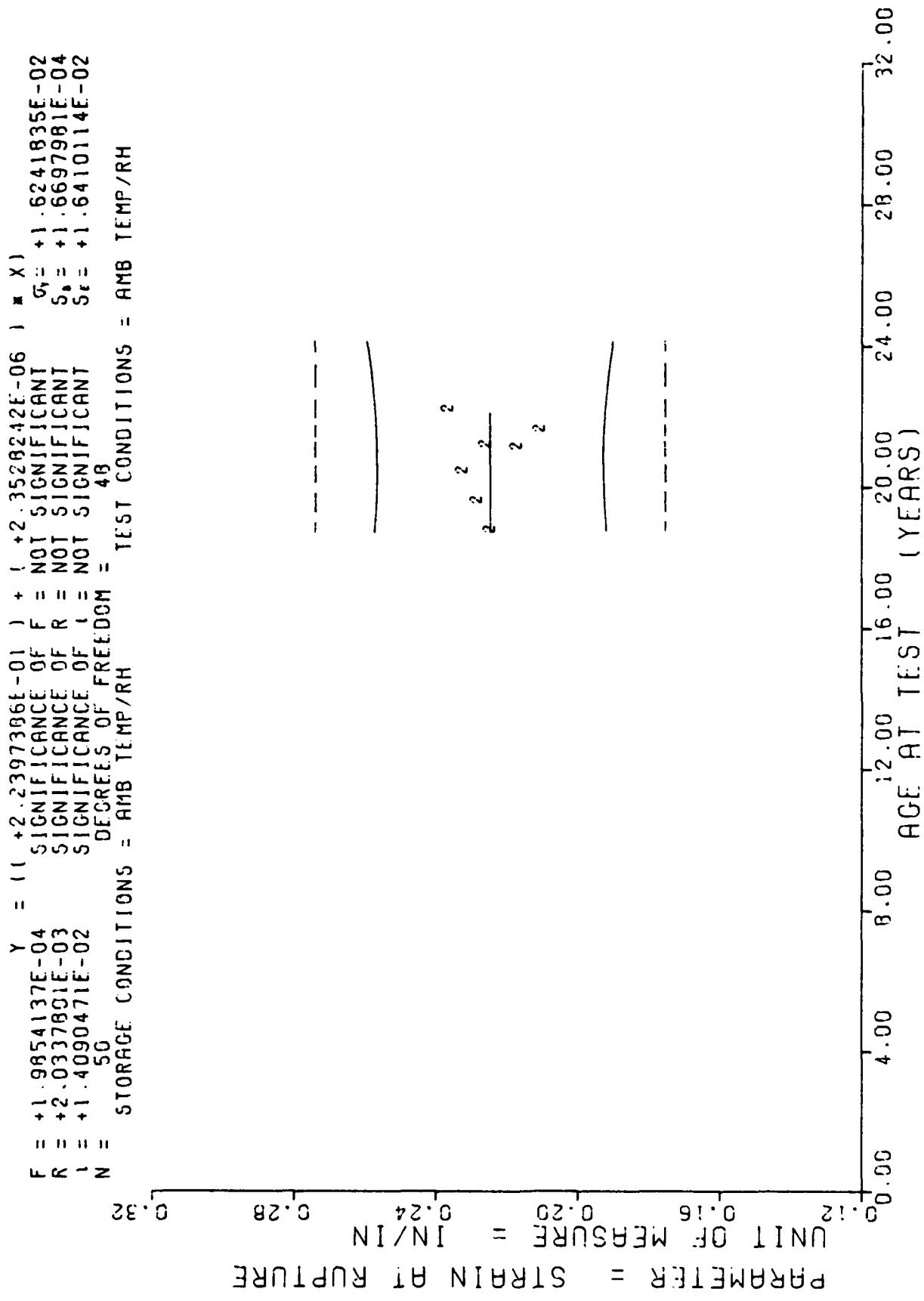
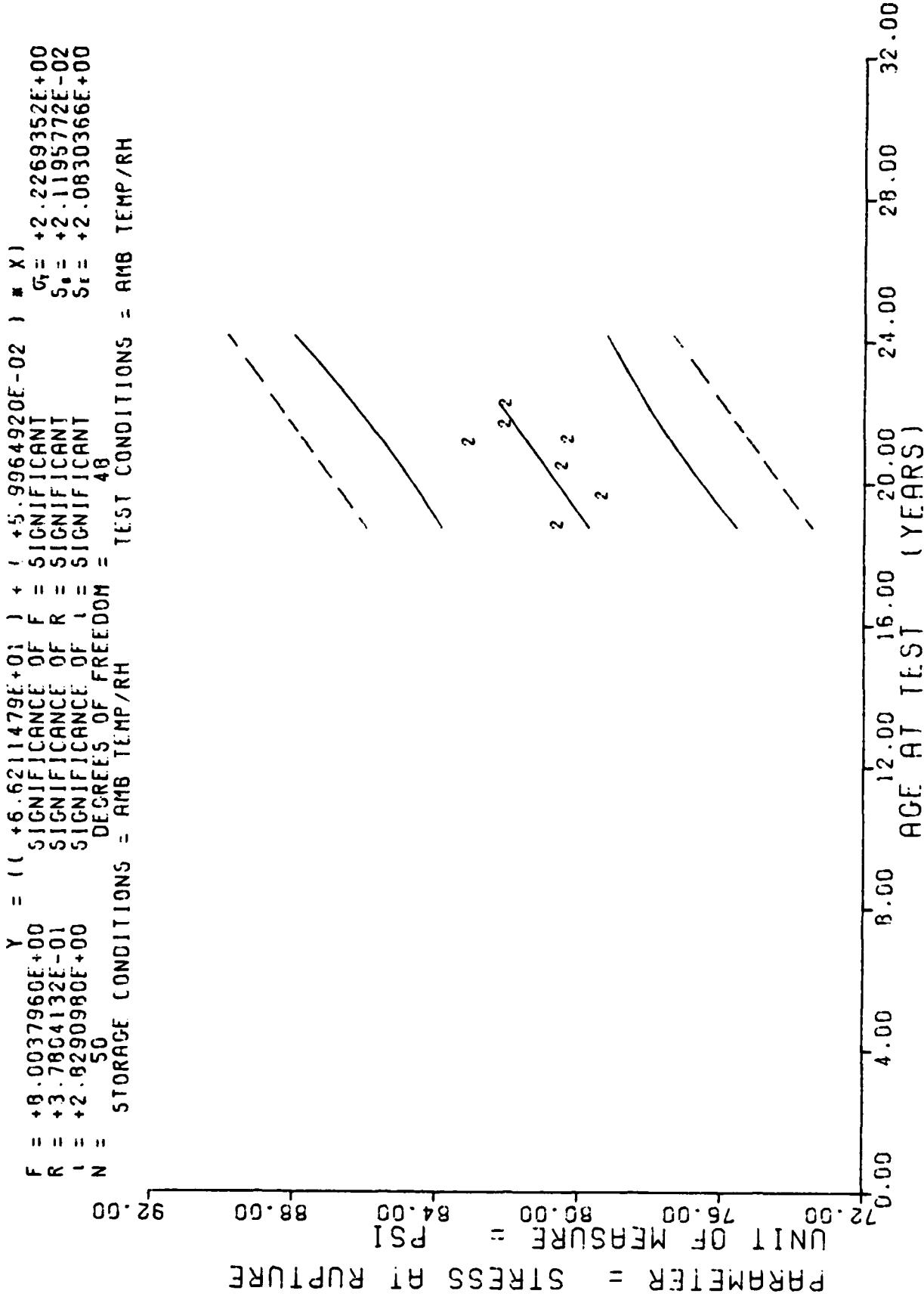


Figure 8

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*  
 \*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
						+2.4159497E-01
225.0	8	+2.2325975E-01	+8.4466220E-03	+2.4159497E-01	+2.1369999E-01	+2.2452676E-01
235.0	8	+2.2706725E-01	+2.4452839E-02	+2.5000000E-01	+1.8199998E-01	+2.2452676E-01
245.0	9	+2.3121076E-01	+8.5871974E-03	+2.4899555E-01	+2.1799999E-01	+2.2455024E-01
253.0	7	+2.158551E-01	+1.1304267E-02	+2.3139555E-01	+1.9899994E-01	+2.2456909E-01
254.0	2	+2.245555E-01	+2.6031201E-02	+2.4229557E-01	+2.0689954E-01	+2.2457146E-01
259.0	7	+2.0942836E-01	+1.3917180E-02	+2.2899557E-01	+1.8999999E-01	+2.2458320E-01
266.0	5	+2.3517745E-01	+1.3126750E-02	+2.4695557E-01	+2.0439994E-01	+2.2459965E-01

STAGE 1 DISSECTED MOTOR=0012029, LOW RATE CHS=0.02 IN/MIN, STRAIN AT RUPT.



STAGE 1 DISSECTED MOTOR=0012029, LOW RATE CHS=0.02 IN/MIN, STRESS AT RUPT.

Figure 9

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
2.25.0	8	+8.0473663E+01	+1.5539977E+00	+8.1829986E+01	+7.7049987E+01	+7.9703582E+01
2.35.0	8	+7.9218658E+01	+3.2655625E+00	+8.4599990E+01	+7.4879989E+01	+8.0303222E+01
2.45.0	9	+8.0346558E+01	+7.3925228E-01	+8.1569552E+01	+7.9399993E+01	+8.0902877E+01
2.53.0	7	+8.2951339E+01	+1.5457188E+00	+8.5259554E+01	+8.0279998E+01	+8.1382599E+01
2.54.0	2	+8.0174987E+01	+1.1670874E+00	+8.1000000E+01	+7.9349990E+01	+8.1442565E+01
2.59.0	7	+8.1528457E+01	+2.6552497E+00	+8.5000000E+01	+7.8699996E+01	+8.1742385E+01
2.66.0	9	+8.1914352E+01	+1.4456886E+00	+8.3739550E+01	+7.9750000E+01	+8.2162139E+01

STAGE 1 DISSECTED MOTOR=012029, LUW RATE CH5=0.02 IN/MIN,STRESS AT RUPY.

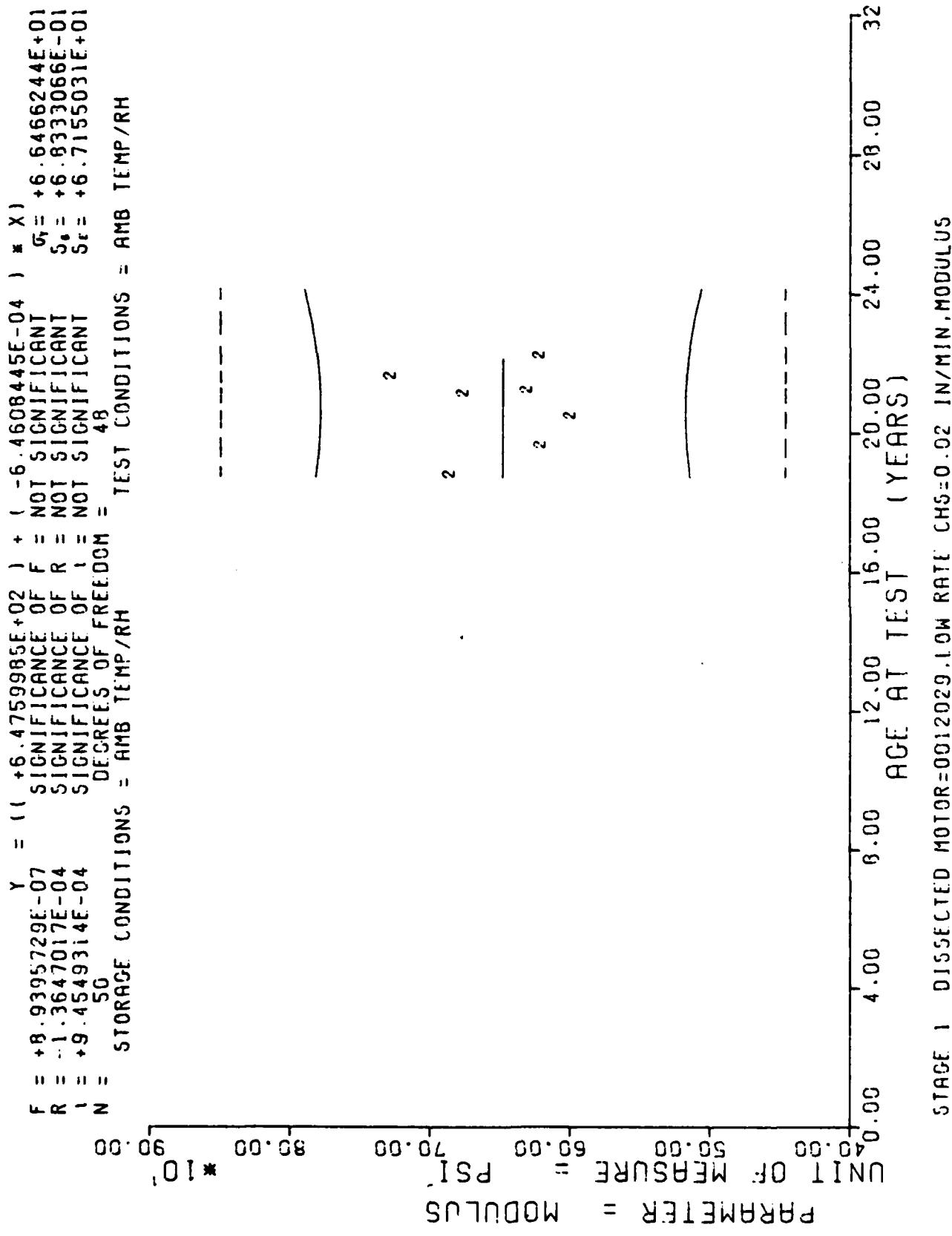


Figure 10

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
225.0	8	+6.8225000E+02	+5.0110591E+01	+7.2000000E+02	+5.6500000E+02	+6.4745434E+02
235.0	8	+6.1762500E+02	+5.4595815E+01	+7.4300000E+02	+5.0800000E+02	+6.4744140E+02
245.0	9	+5.9644333E+02	+3.0290720E+01	+6.4100000E+02	+5.5800000E+02	+6.4743627E+02
253.0	7	+6.7285693E+02	+2.7691325E+01	+7.0600000E+02	+6.4300000E+02	+6.4743554E+02
254.0	2	+6.2750000E+02	+2.4748737E+01	+6.4500000E+02	+6.1000000E+02	+6.4743237E+02
259.0	7	+7.2471411E+02	+6.6755985E+01	+7.8500000E+02	+6.1900000E+02	+6.4742797E+02
266.0	9	+6.1855541E+02	+1.6148615E+01	+6.4400000E+02	+5.9800000E+02	+6.4742797E+02

STAGE 1 DISSECTED MOTOR=0012029, LOW RATE CHS=0.02 IN/IN, MODULUS

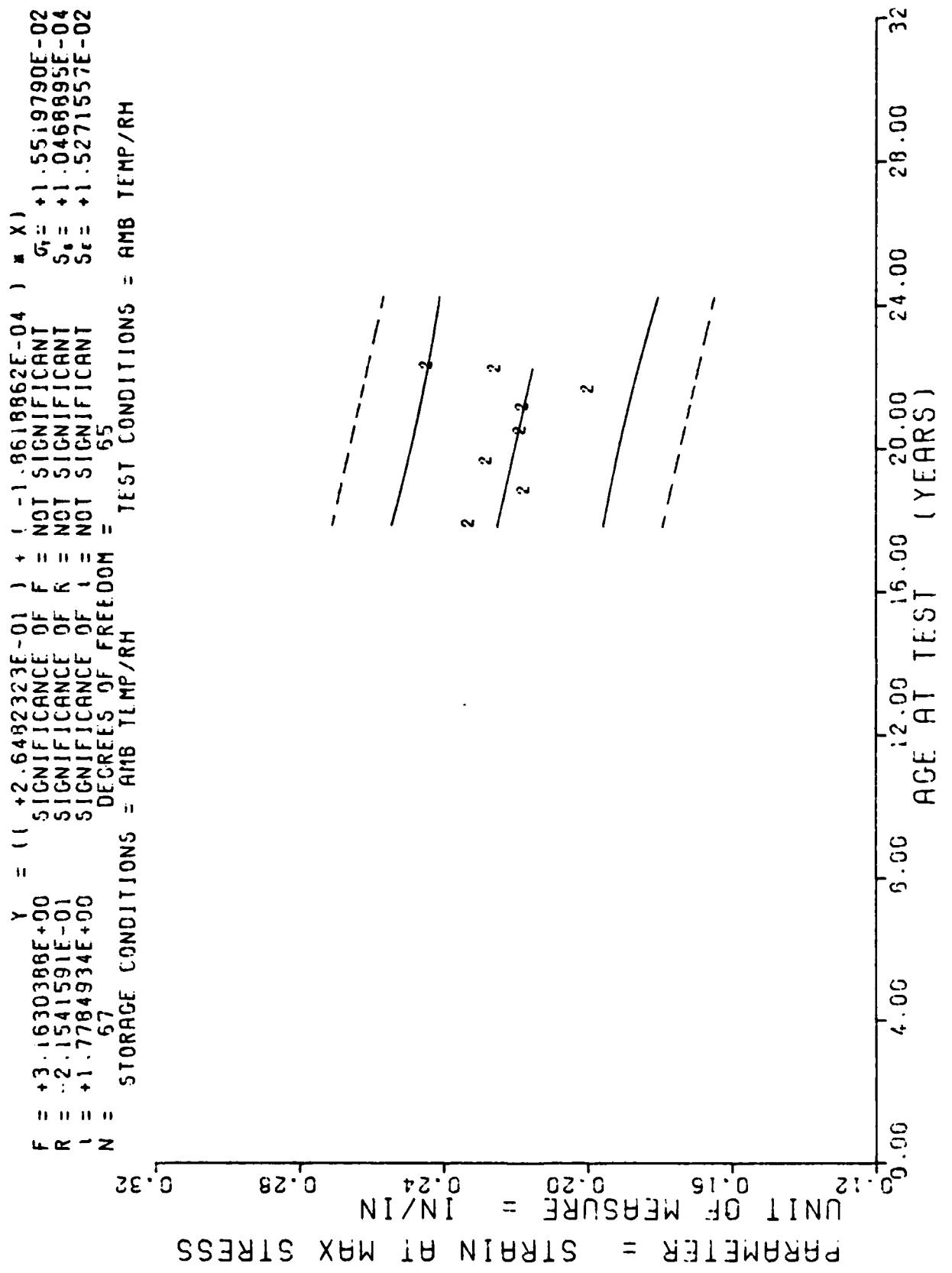


Figure 11

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION		MINIMUM Y	REGRESSION Y
			Y	Y		
214.0	9	+2.163294E-01	+2.2495635E-03	+2.3589598E-01	+2.28399999E-01	+2.2457886E-01
214.0	10	+2.1630572E-01	+2.1626045E-02	+2.3669599E-01	+1.68999996E-01	+2.2293078E-01
225.0	8	+2.2676229E-01	+7.5737815E-03	+2.3449555E-01	+2.1199995E-01	+2.2106885E-01
235.0	9	+2.1734416E-01	+6.4648784E-03	+2.244994E-01	+2.0669996E-01	+2.1920698E-01
245.0	9	+2.1673303E-01	+6.5440305E-03	+2.2559955E-01	+2.0999997E-01	+2.1771746E-01
253.0	10	+1.955581E-01	+1.6176368E-02	+2.2799998E-01	+1.89999999E-01	+2.1660035E-01
259.0	9	+2.243E59E-01	+5.4298696E-03	+2.33799999E-01	+2.13299998E-01	+2.1529704E-01
266.0	3	+2.4325996E-01	+3.4805782E-03	+2.4609594E-01	+2.3939996E-01	+2.1511083E-01
267.0						

STAGE 1 DISSECTED MOTOR=9012029,LOW RATE CHS=0.2 IN/MIN, STRAIN MAX STRESS

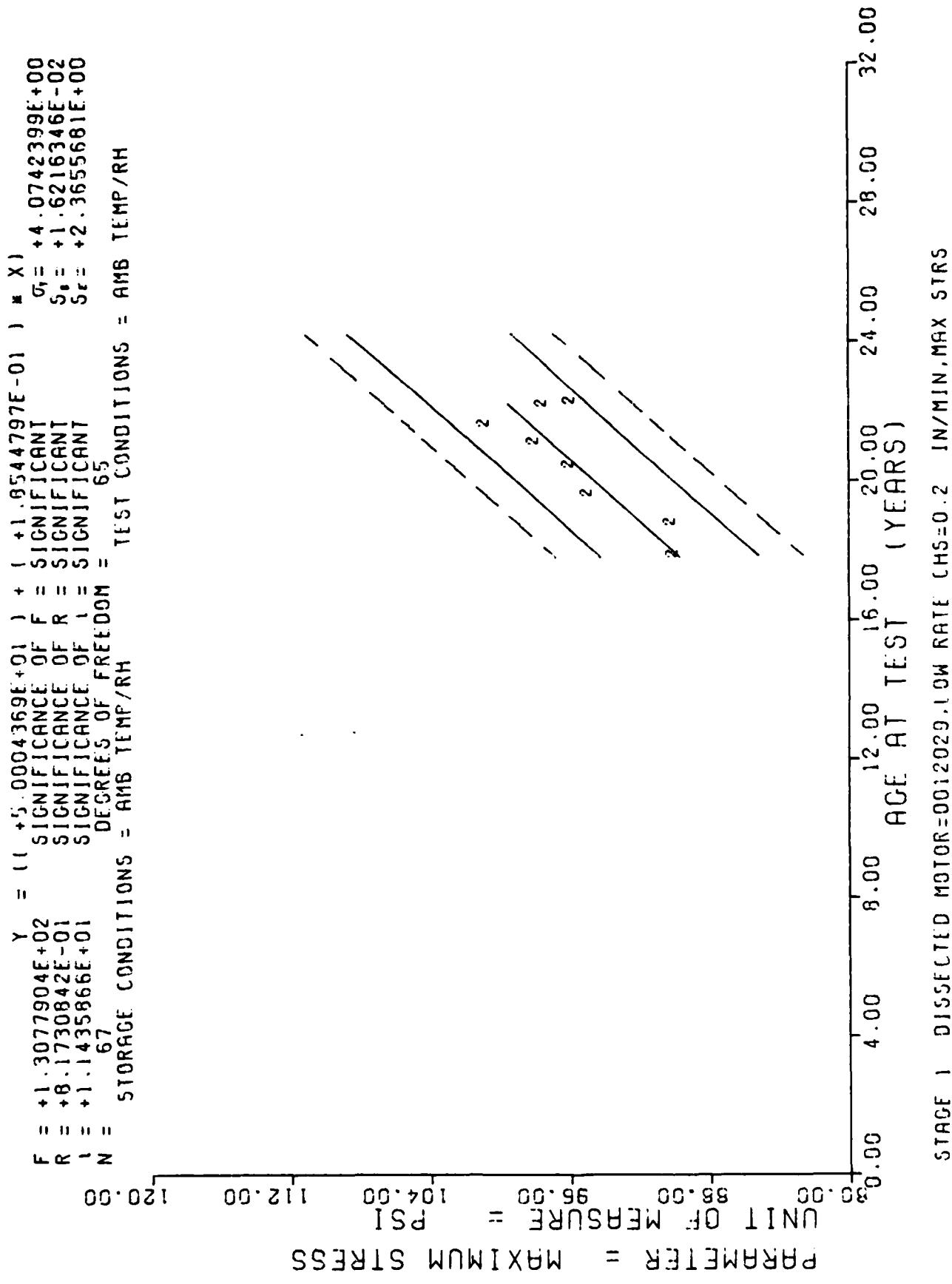


Figure 12

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION			MINIMUM Y	REGRESSION Y
			1	2	3		
214.0	9	+8.9844314E+01	+4.3967617E-01	+9.0569992E+01	+8.9299987E+01	+8.9690231E+01	+8.1730148E+01
	10	+8.5588937E+01	+1.9886763E+00	+9.4089996E+01	+8.5879989E+01	+8.3584640E+01	+9.3584640E+01
225.0	8	+9.4737356E+01	+2.1829216E+00	+9.9149593E+01	+9.2059997E+01	+9.5439117E+01	+9.5439117E+01
235.0	8	+9.5766767E+01	+1.6678866E+00	+9.8619595E+01	+9.2899993E+01	+9.6922698E+01	+9.6922698E+01
245.0	9	+9.5788778E+01	+8.9193545E-01	+9.8959591E+01	+9.6519989E+01	+9.8035385E+01	+9.8035385E+01
253.0	10	+1.0657987E+02	+2.2927236E+00	+1.0179598E+02	+9.4299987E+01	+9.9333526E+01	+9.9333526E+01
259.0	9	+9.7322057E+01	+1.6027182E+00	+9.9215985E+01	+9.4429992E+01	+9.9518966E+01	+9.9518966E+01
266.0	3	+9.5719970E+01	+1.4202638E+00	+9.7189587E+01	+9.4359985E+01	+9.9518966E+01	+9.9518966E+01
267.0							

STAGE 1 DISSECTED MCTOR=0012429, LOW RATE CH5=0.02 IN/MIN, MAX STRS.

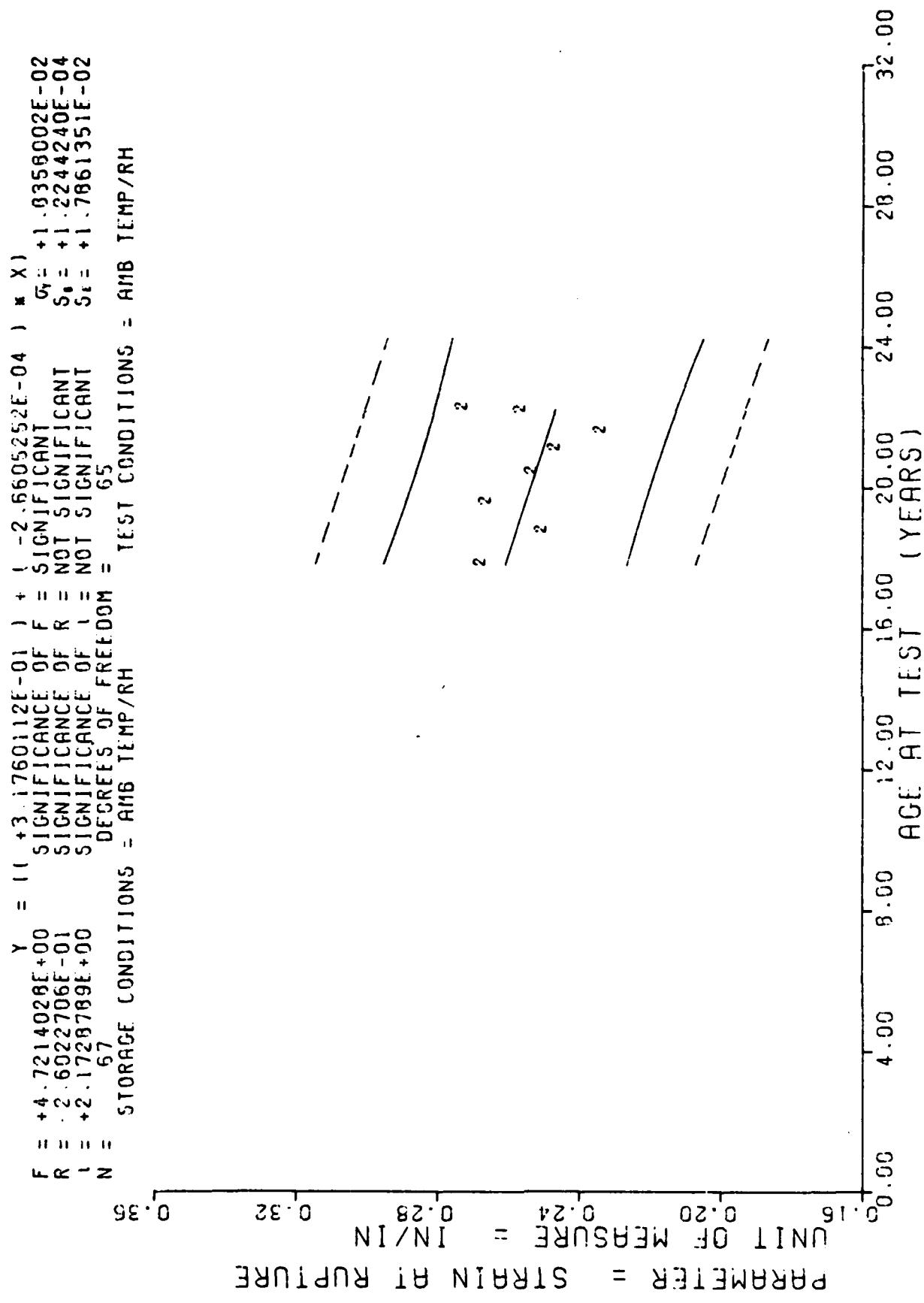


Figure 13

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION		MAXIMUM Y	MINIMUM Y	REGRESSION Y
			Y	Y			
214.0	9	+2.6644408E-01	+7.4496370E-03	+2.8029596E-01	+2.5659956E-01	+2.6066583E-01	
214.0	10	+2.4535960E-01	+2.9078959E-02	+2.7799599E-01	+1.8199998E-01	+2.5773930E-01	
225.0	8	+2.6504957E-01	+4.4618889E-03	+2.7079599E-01	+2.5979995E-01	+2.5507873E-01	
235.0	8	+2.6504957E-01	+4.4618889E-03	+2.7079599E-01	+2.5979995E-01	+2.5507873E-01	
245.0	9	+2.5224405E-01	+1.2267790E-02	+2.7199595E-01	+2.3499995E-01	+2.5241822E-01	
253.0	9	+2.4577742E-01	+1.1050488E-02	+2.6099597E-01	+2.2589999E-01	+2.5028979E-01	
259.0	10	+2.3285566E-01	+1.1634189E-02	+2.5299596E-01	+2.1999996E-01	+2.4869346E-01	
266.0	9	+2.535529E-01	+1.4185014E-02	+2.7559595E-01	+2.2269999E-01	+2.4683111E-01	
267.0	3	+2.7165956E-01	+1.6100242E-02	+2.6779595E-01	+2.5559997E-01	+2.4656504E-01	

STAGE 1 DISSECTED MCTORF=0012029,LOW RATE CH5=0.2 IN/MIN,STRAIN AT RUPT.

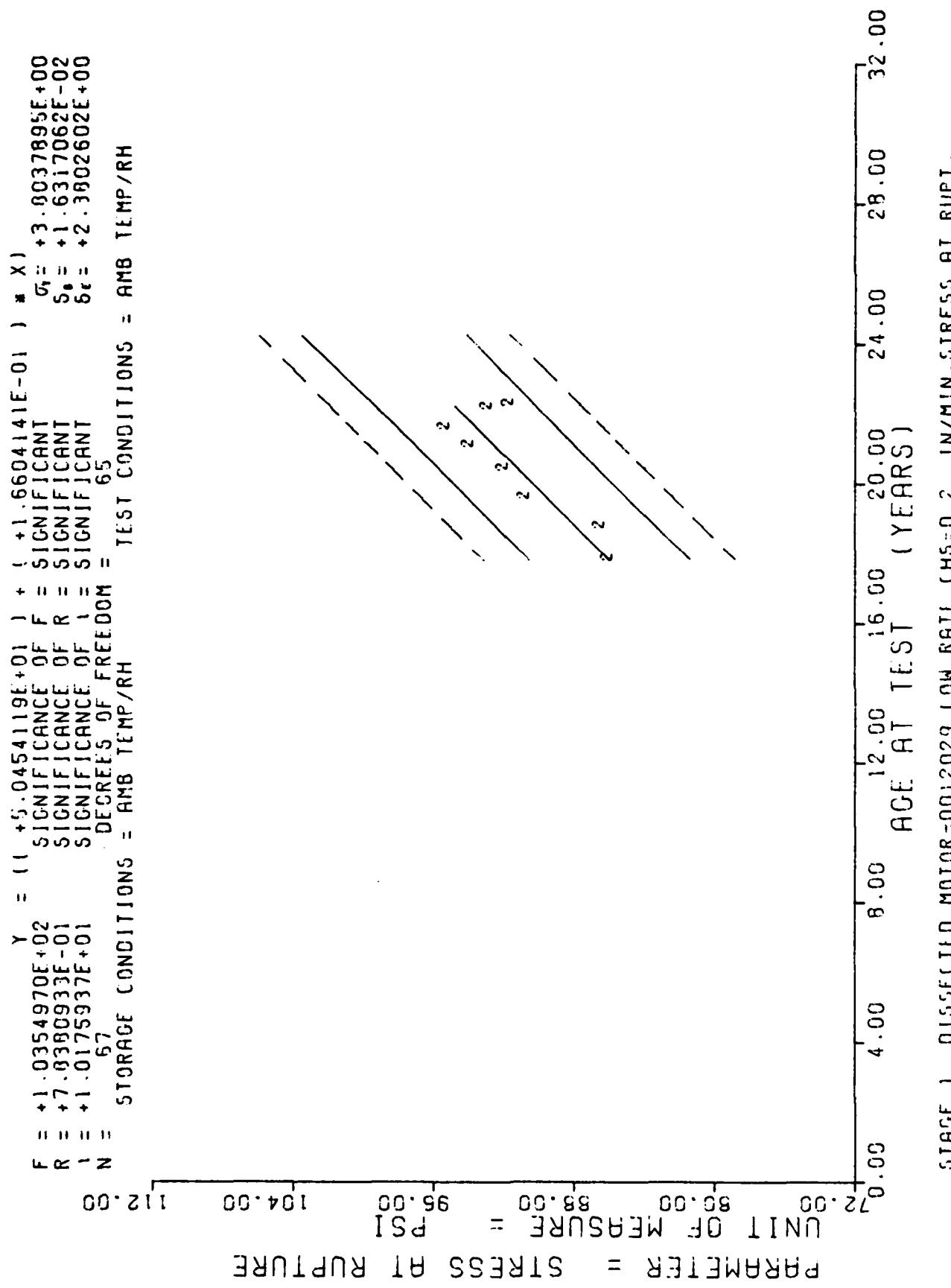


Figure 14

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
214.0	9	+8.5653271E+01	+1.3605270E+00	+8.7459521E+01	+8.3429992E+01	+8.5986968E+01
225.0	10	+8.6255896E+01	+1.9548672E+00	+8.9599990E+01	+8.2699996E+01	+8.7813430E+01
235.0	8	+5.0591156E+01	+1.7217584E+00	+9.3299587E+01	+8.7899993E+01	+8.9473846E+01
245.0	9	+9.1801025E+01	+2.1329450E+00	+9.4599590E+01	+8.9000000E+01	+9.1134262E+01
253.0	9	+9.2764373E+01	+1.4517947E+00	+9.6500000E+01	+9.16299989E+01	+9.2462585E+01
259.0	10	+5.5135597E+01	+2.0436064E+00	+9.7599590E+01	+9.1500000E+01	+9.3458831E+01
266.0	9	+5.2707672E+01	+2.5967719E+00	+9.7609585E+01	+8.9000000E+01	+9.4621124E+01
267.0	3	+5.14833306E+01	+1.5727012E+00	+9.3239550E+01	+8.9349990E+01	+9.4707170E+01

STAGE 1 DISSECTED MOTOR=0012029,LOW RATE CHS=0.2 IN/IN,STRESS AT RUPT.

$F = +1.7138056E+01$        $y = ( ( +1.6533313E+02 ) + ( +2.3909624E+00 ) * x )$   
 $R = +4.5678157E-01$        $F = \text{SIGNIFICANT}$        $G_f = +9.3988490E+01$   
 $R^2 = +4.1398135E+00$        $\text{SIGNIFICANCE OF } R = \text{SIGNIFICANT}$        $S_f = +5.7755316E-01$   
 $N = 67$        $\text{SIGNIFICANCE OF } r = \text{SIGNIFICANT}$        $S_r = +3.4250876E+01$   
 $\text{DEGREES OF FREEDOM} = 65$        $\text{TEST CONDITIONS} = \text{AMB TEMP/RH}$

STORAGE CONDITIONS = AMB TEMP/RH

UNIT OF MEASURE = PSI  
 PARAMETER = MODULUS  
 40.00 60.00 80.00 100.00 120.00 \* 10

AGE AT TEST (YEARS)

0.00 4.00 8.00 12.00 16.00 20.00 24.00 28.00 32.00

STAGE 1 DISSECTED MOTOR=0012029, LOW RATE CHS=0.2 IN/MIN, MODULUS

Figure 15

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
214.0	9	+6.7023325E+02	+1.1022703E+01	+6.8700000E+02	+6.5600000E+02	+6.7699902E+02
225.0	10	+7.1850000E+02	+8.2120845E+01	+8.3400000E+02	+6.1000000E+02	+7.0329956E+02
236.0	8	+6.5275000E+02	+4.9114298E+01	+7.6600000E+02	+6.2600000E+02	+7.2720922E+02
245.0	9	+7.150E067E+02	+3.8550111E+01	+7.9400000E+02	+6.7700000E+02	+7.5111889E+02
253.0	9	+7.9155541E+02	+3.5919377E+01	+8.4500000E+02	+7.3600000E+02	+7.7024658E+02
259.0	10	+9.1589990E+02	+8.1826585E+01	+9.7600000E+02	+7.4100000E+02	+7.8459228E+02
266.0	9	+7.3500000E+02	+2.4799193E+01	+7.8000000E+02	+6.8600000E+02	+9.0132910E+02
267.0	3	+6.6800000E+02	+1.5467922E+01	+6.8300000E+02	+6.4600000E+02	+8.0371997E+02

STAGE 1 DISSECTED MOTOR=0012029,LOW RATE CHS=0.2 IN/MIN,MODULUS

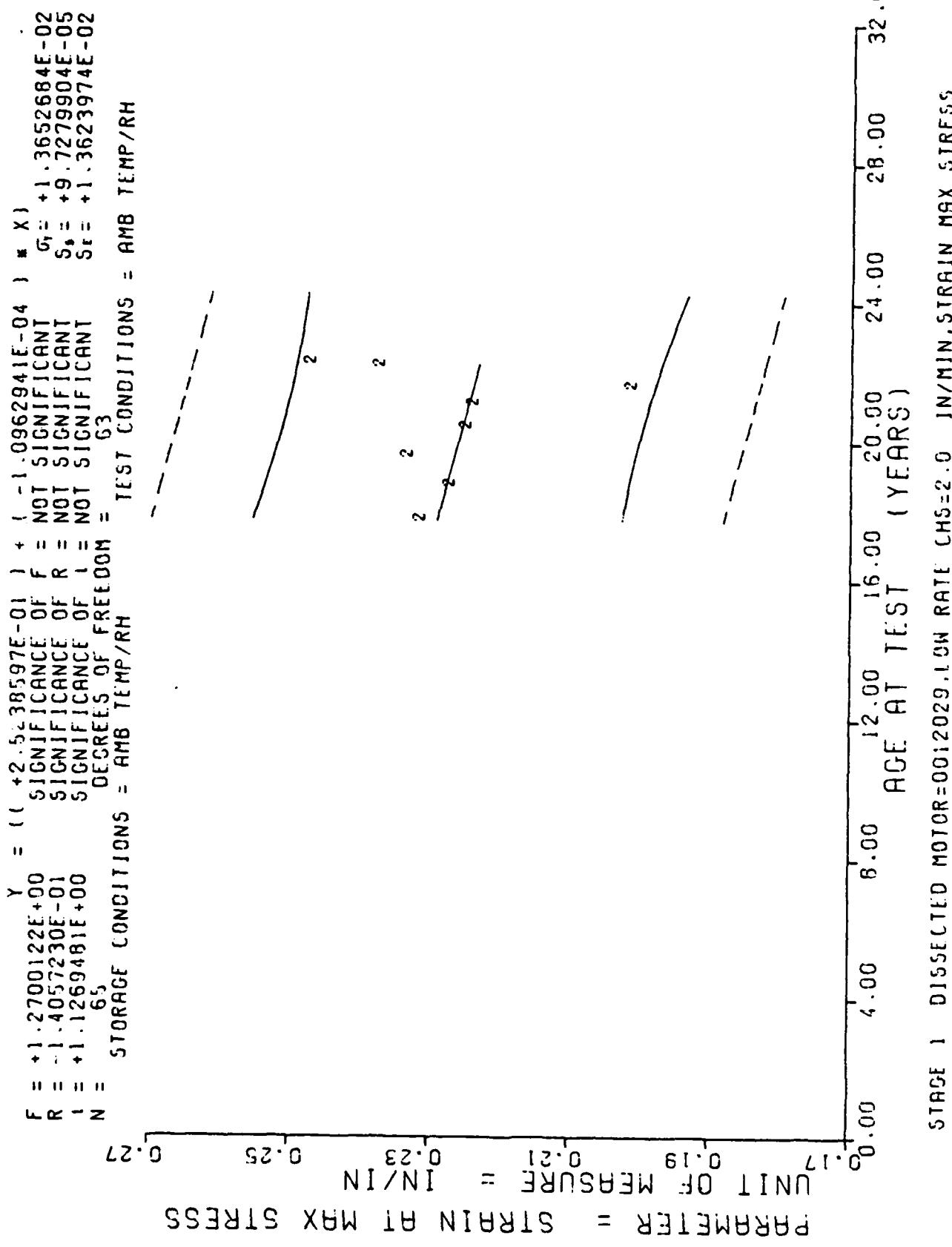


Figure 16

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION Y	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	7	+2.2094224E-01	+7.6251006E-03	+2.4059558E-01	+2.1799599E-01	+2.2903490E-01
225.0	9	+2.2672194E-01	+7.3190848E-03	+2.3649556E-01	+2.1299999E-01	+2.2771930E-01
235.0	9	+2.3273307E-01	+1.0049670E-02	+2.4799556E-01	+2.1979999E-01	+2.2662305E-01
245.0	9	+2.2442191E-01	+4.3308148E-03	+2.2859556E-01	+2.1519994E-01	+2.2552675E-01
253.0	9	+2.2337752E-01	+6.7721894E-03	+2.3279554E-01	+2.1389997E-01	+2.2464972E-01
259.0	10	+2.0085666E-01	+2.7862427E-03	+2.0399559E-01	+1.9599997E-01	+2.2399193E-01
266.0	9	+2.3681074E-01	+6.6377722E-03	+2.4599599E-01	+2.2599995E-01	+2.2322452E-01
267.0	3	+2.4666661E-01	+6.6222938E-03	+2.5169598E-01	+2.3889994E-01	+2.2311490E-01

STAGE 1 DISSECTED MOTOR=0012029, LOW RATE CHS=2.0 IN/MIN. STRAIN MAX STRESS

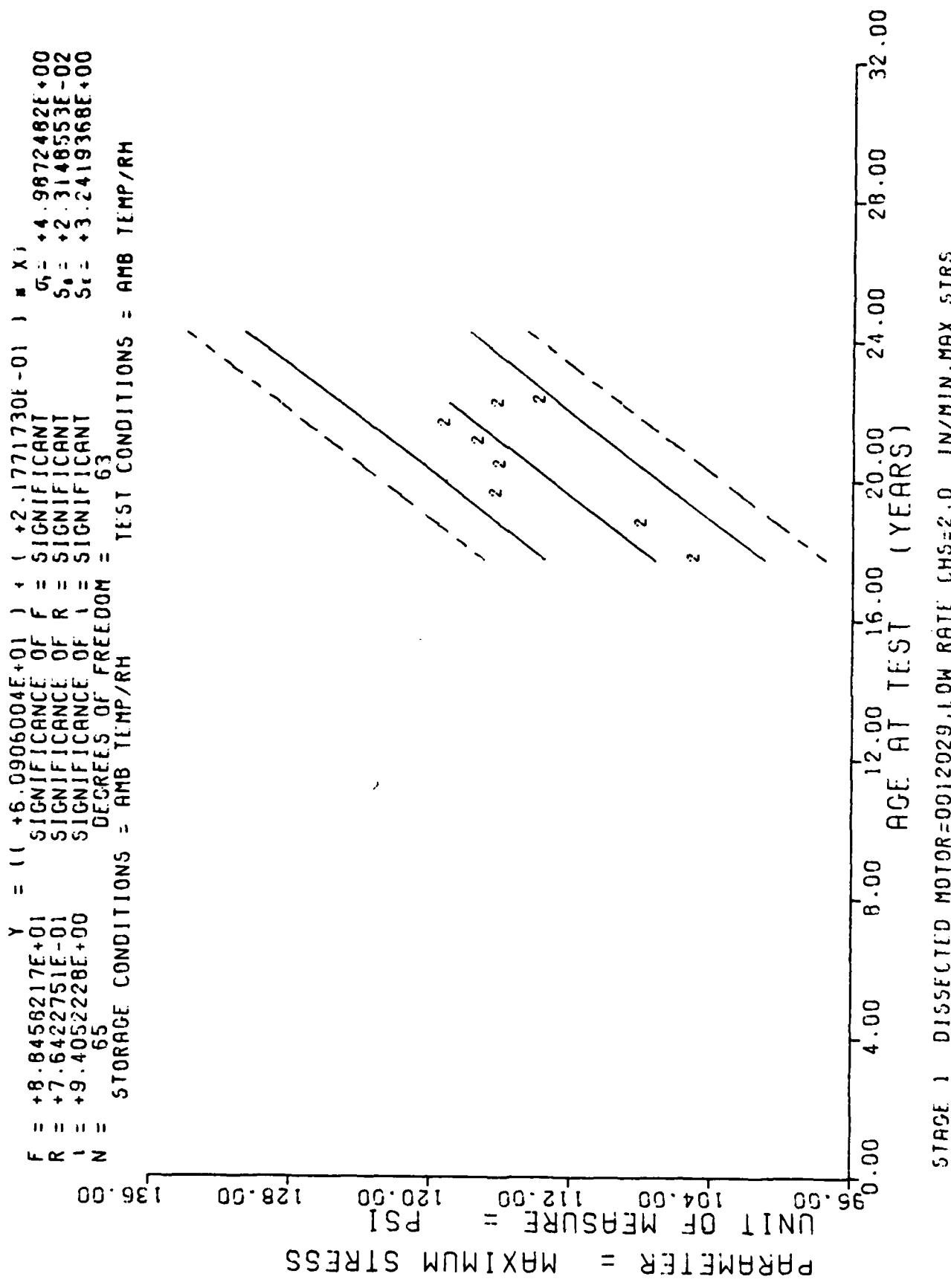


Figure 17

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	7	+1.04E0419E+02	+1.05E04595E+00	+1.0630559E+02	+1.0296959E+02	+1.0727978E+02
225.0	9	+1.0779431E+02	+8.7151532E-01	+1.0948599E+02	+1.0689999E+02	+1.0989239E+02
235.0	9	+1.1606770E+02	+3.6591812E+00	+1.2085598E+02	+1.1043998E+02	+1.1206956E+02
245.0	9	+1.1566655E+02	+1.5542971E+00	+1.2110998E+02	+1.1451998E+02	+1.1424673E+02
253.0	9	+1.1710656E+02	+8.5701457E-01	+1.1828599E+02	+1.1595999E+02	+1.1598847E+02
259.0	10	+1.15CC950E+02	+1.2924222E+00	+1.2100000E+02	+1.1779998E+02	+1.1729478E+02
266.0	9	+1.1558211E+02	+1.7211295E+00	+1.1926598E+02	+1.1413999E+02	+1.1881880E+02
267.0	3	+1.13E2555E+02	+1.1E63402E+00	+1.1496558E+02	+1.1272959E+02	+1.1903651E+02

STAGE 1 DISSECTED MOTOR=0012029, LOW RATE CHS=2.0 IN/MIN, MAX STRS.

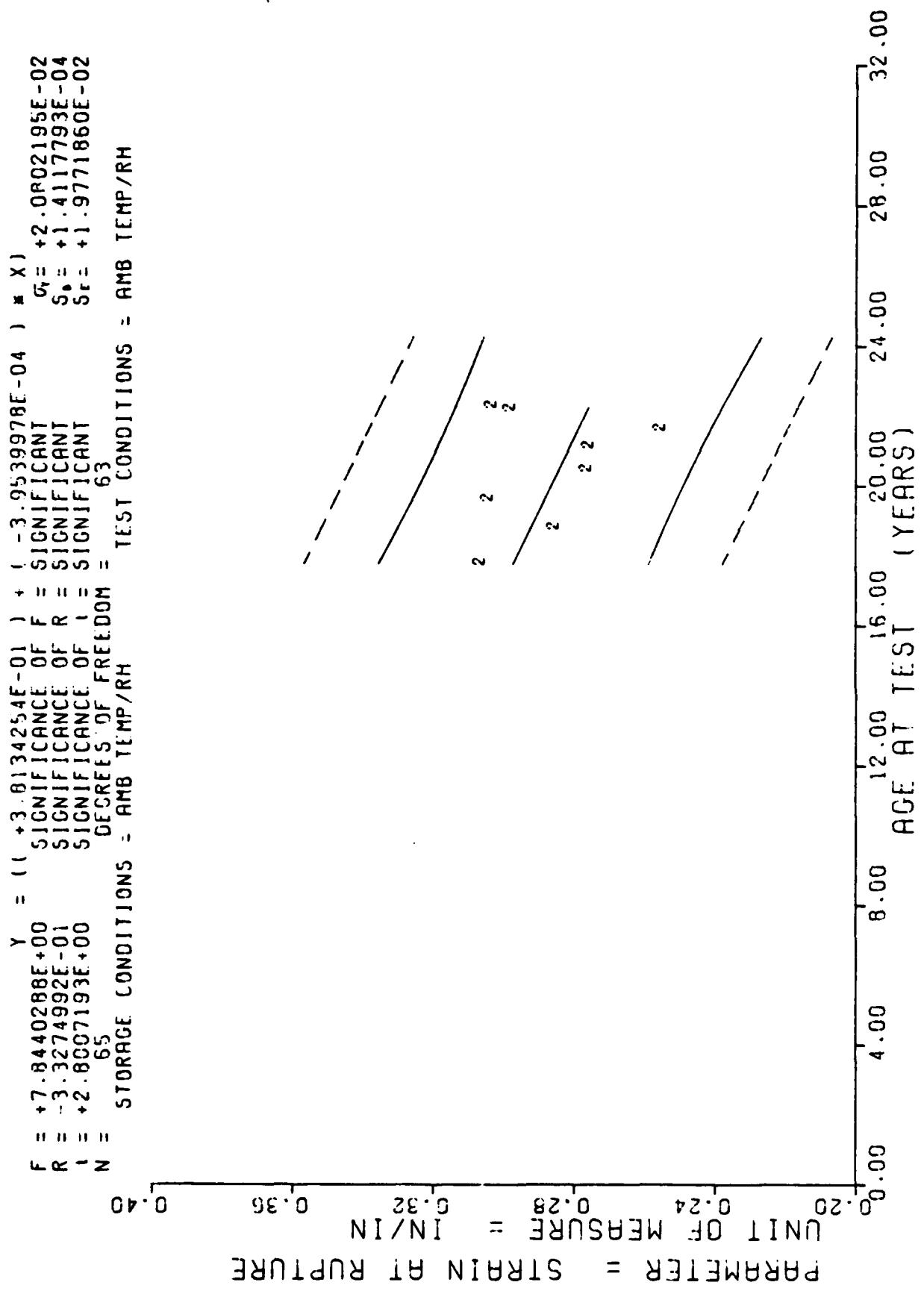


Figure 18

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION Y	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	7	+3.0534249E-01	+6.4243548E-03	+3.1599598E-01	+2.9799957E-01	+2.9712235E-01
225.0	9	+2.8454399E-01	+7.2308748E-03	+2.9649596E-01	+2.7569997E-01	+2.9237759E-01
235.0	9	+3.0321073E-01	+1.5653340E-02	+3.03295554E-01	+2.7199995E-01	+2.6842359E-01
245.0	9	+2.7525968E-01	+1.0789632E-02	+2.9259597E-01	+2.5999999E-01	+2.8446954E-01
253.0	9	+2.7466660E-01	+1.650600C9E-02	+3.0169999E-01	+2.4779999E-01	+2.6130638E-01
259.0	10	+2.5429965E-01	+8.0941206E-03	+2.6399999E-01	+2.3799997E-01	+2.78993400E-01
266.0	9	+2.56695528E-01	+1.4374271E-02	+3.1399995E-01	+2.6799994E-01	+2.7616620E-01
267.0	3	+3.0215595E-01	+1.5414270E-02	+3.1109594E-01	+2.8439998E-01	+2.7577078E-01

STAGE 1 DISSECTED MCFOR=0012029,LOW RATE CHS=2.0 IN. MIN. STRAIN AT RUPT.

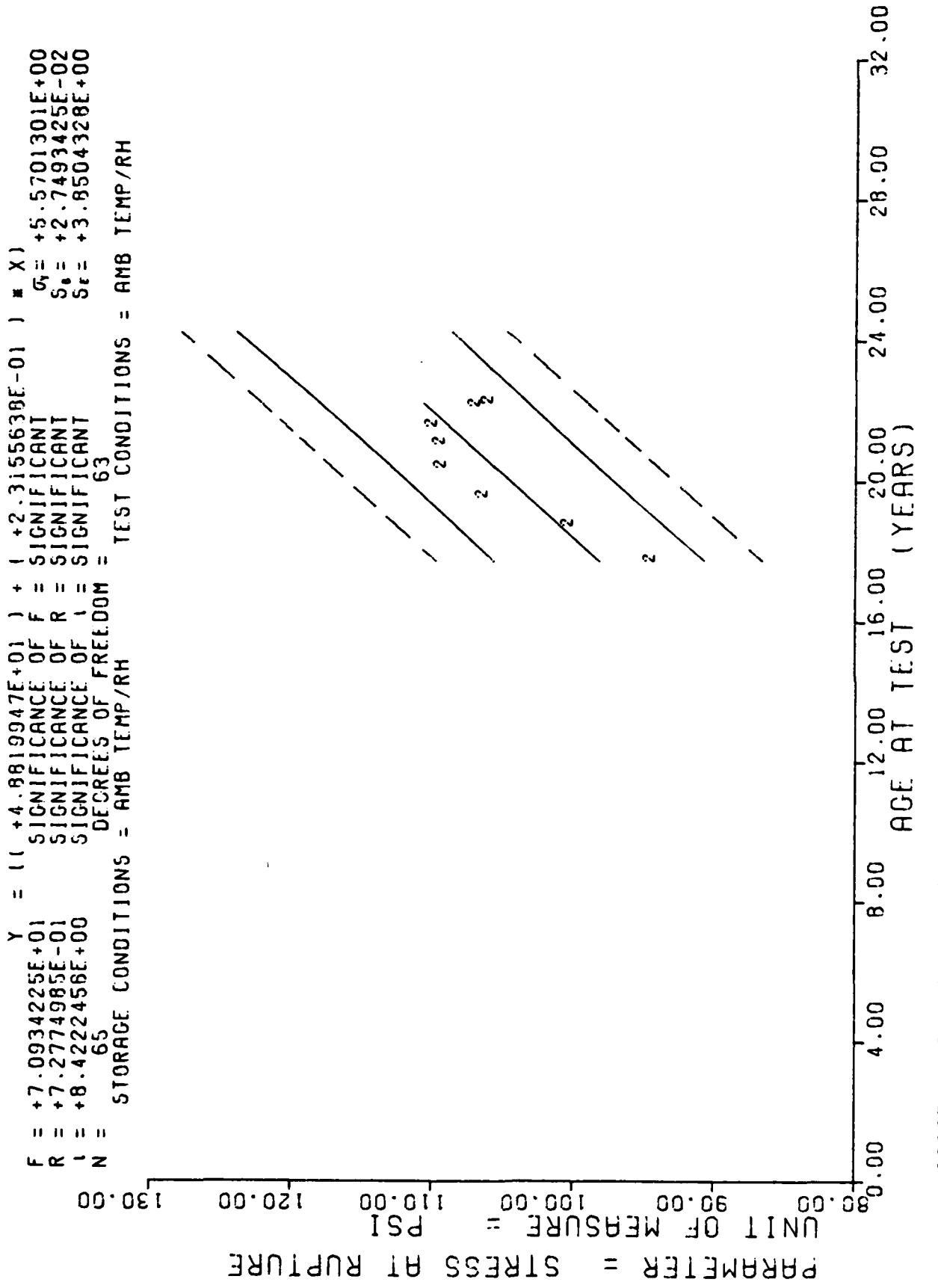


Figure 19

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	7	+9.4235913E+01	+1.9654567E+00	+9.6500000E+01	+9.1439987E+01	+9.8141448E+01
225.0	9	+1.0006433E+02	+1.8355831E+00	+1.0234999E+02	+9.7500000E+01	+1.0092012E+02
235.0	9	+1.0612589E+02	+3.2496143E+00	+1.0989559E+02	+1.00399999E+02	+1.0323568E+02
245.0	9	+1.0506435E+02	+2.1877066E+00	+1.1365599E+02	+1.0555999E+02	+1.0555125E+02
253.0	9	+1.0517675E+02	+2.7664300E+00	+1.1275599E+02	+1.0512998E+02	+1.0740370E+02
259.0	10	+1.0572991E+02	+2.0064762E+00	+1.1350000E+02	+1.0750000E+02	+1.0879304E+02
266.0	9	+1.0666545E+02	+3.0032152E+00	+1.1163999E+02	+1.0136999E+02	+1.1041394E+02
267.0	3	+1.0576592E+02	+2.6627130E+00	+1.0863599E+02	+1.0416999E+02	+1.1064549E+02

STAGE 1 DISSECTED MOTOR=0012029, LOW RATE CHS=2.0 IN/MIN. STRESS AT RUPT.

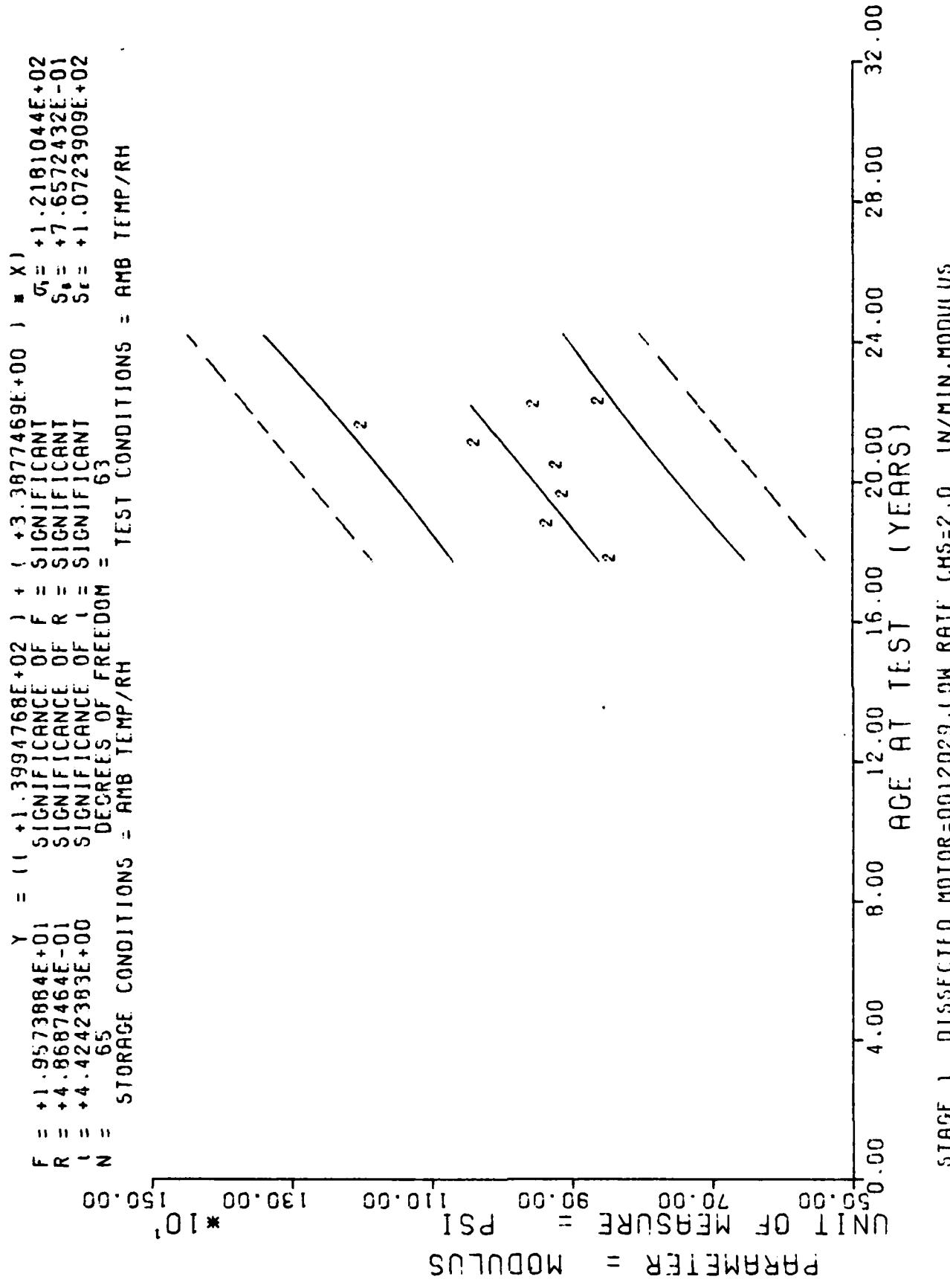


Figure 20

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	7	+8.3928564E+02	+4.7562590E+01	+9.0800000E+02	+7.6700000E+02	+8.6153759E+02
225.0	9	+9.2866650E+02	+4.5295030E+01	+1.0110000E+03	+8.7400000E+02	+9.0219067E+02
235.0	9	+9.0644433E+02	+9.5633216E+01	+1.0340000E+03	+7.8000000E+02	+9.3606811E+02
245.0	9	+9.1566650E+02	+6.2090659E+01	+1.0790000E+03	+8.7900000E+02	+9.6994555E+02
253.0	9	+1.0323322E+03	+4.2790185E+01	+1.0900000E+03	+9.6100000E+02	+9.9704760E+02
259.0	10	+1.1532598E+03	+2.5033533E+01	+1.2350000E+03	+1.1650000E+03	+1.0173740E+03
266.0	9	+5.4800000E+02	+3.0211752E+01	+9.8900000E+02	+9.0900000E+02	+1.0410881E+03
267.0	3	+8.55666650E+02	+4.3730233E+01	+9.0600000E+02	+8.2700000E+02	+1.0444760E+03

STAGE 1 DISSECTED MOTOR=0012029,LOW RATE CHS=2.0 IN/MIN,MODULUS

$F = +5.455i789E+01$     $Y = ( +2.7337347E-02 ) + ( +1.2480227E-03 ) * X$   
 $R = +6.5397511E-01$    SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +6.5397511E-01$    SIGNIFICANCE OF R = SIGNIFICANT  
 $\sigma_1 = +7.3859183E+00$    SIGNIFICANCE OF  $\sigma_1$  = SIGNIFICANT  
 $N = 75$    DEGREES OF FREEDOM = 73  
 STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = AMB TEMP/RH

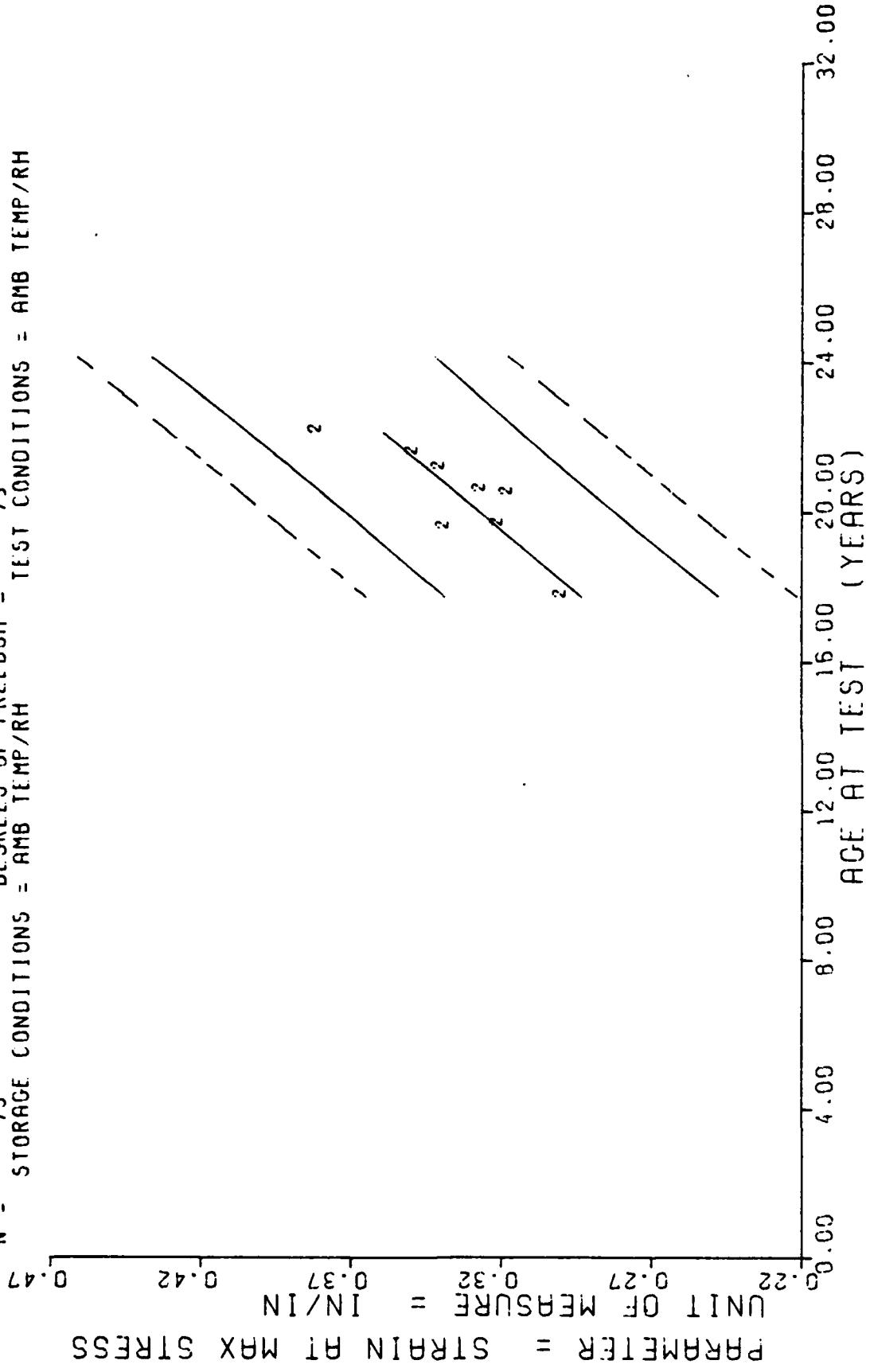


Figure 21

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

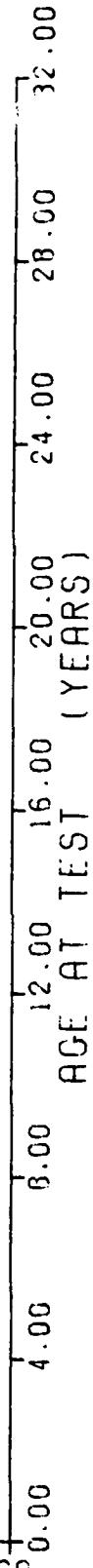
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	12	+2.5E66629E-01	+3.2409414E-02	+3.32999594E-01	+2.3299958E-01	+2.9316616E-01
235.0	6	+3.3771622E-01	+8.8305040E-03	+3.4899597E-01	+3.2629996E-01	+3.2062269E-01
236.0	12	+3.1574965E-01	+1.0049670E-02	+3.3799599E-01	+3.0299957E-01	+3.2187069E-01
246.0	10	+3.1668972E-01	+2.0323049E-02	+3.5499555E-01	+2.7779956E-01	+3.3435094E-01
247.0	9	+3.2565568E-01	+1.6035606E-02	+3.4755598E-01	+2.9899956E-01	+3.3559894E-01
254.0	9	+3.3922183E-01	+1.4102945E-02	+3.5199599E-01	+3.0399996E-01	+3.4433507E-01
259.0	8	+3.4812462E-01	+1.5958611E-02	+3.6099594E-01	+3.1599958E-01	+3.5057520E-01
266.0	9	+3.8022184E-01	+3.1665681E-02	+4.1769958E-01	+3.4099956E-01	+3.5931134E-01

STAGE 1.DISC'TED MCTOR=0012029.L.R.HYDRC.CHS=2.0 IN/MIN.800 PSI. STRAIN MAX STRS.

$F = +6.915443E+01$        $Y = ( ( -4.2779603E+01 ) + ( +8.5397138E-01 ) * X )$   
 $R = +6.9747689E-01$       SIGNIFICANCE OF  $F =$  SIGNIFICANT  
 $R = +8.3159150E+00$       SIGNIFICANCE OF  $R =$  SIGNIFICANT  
 $N = 75$       SIGNIFICANCE OF  $N =$  SIGNIFICANT  
 $D$  = DEGREES OF FREEDOM = 73  
 STORAGE CONDITIONS = AMB TEMP/RH

UNIT OF MEASURE = PSI  
 PARAMETER = MAXIMUM STRESS  
 80.00 120.00 160.00 200.00 240.00 280.00

- 58 -



STAGE 1. DISCTED MOTOR=0012029.L.R.HYDRO.CHG=2.0 IN/MIN,800 PSI,MAX STRS

Figure 22

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

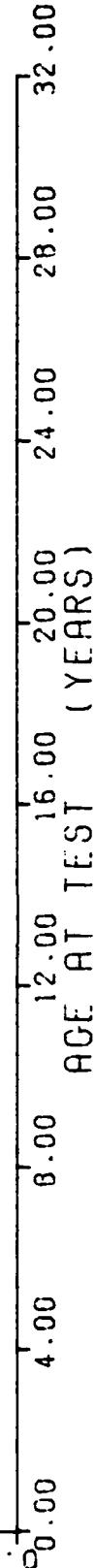
\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	REGRESSION Y	
				MAXIMUM Y	MINIMUM Y
213.0	12	+1.4307159E+02	+2.2495827E+01	+1.6769559E+02	+1.0521998E+02
235.0	6	+1.5243322E+02	+1.5158548E+01	+1.7609559E+02	+1.3900999E+02
236.0	12	+1.4518408E+02	+8.5602996E+00	+1.6205599E+02	+1.4059999E+02
246.0	10	+1.722891E+02	+5.0775560E+00	+1.8200000E+02	+1.5000000E+02
247.0	9	+1.7703324E+02	+1.1281037E+01	+1.8985559E+02	+1.5500000E+02
254.0	9	+1.64E0680E+02	+7.5317291E+00	+1.8409559E+02	+1.6009999E+02
259.0	8	+1.8621246E+02	+1.0574632E+01	+2.0097599E+02	+1.7150000E+02
266.0	9	+1.8245989E+02	+1.0578065E+01	+1.6939559E+02	+1.6975000E+02

STAGE 1, DISCTED MCTDR=0012029, L.R.HYDRC.CHS=2.0 IN/MIN, 800 PSI, MAX STRS.

$F = +3.6660902E+01$        $F = +1.0611034E-01$        $F = +1.1554337E-03$        $X = +3.2772864E-02$   
 $R = +5.7819677E-01$       SIGNIFICANCE OF  $F$  = SIGNIFICANT  
 $R = +5.7819677E-01$       SIGNIFICANCE OF  $R$  = SIGNIFICANT  
 $R = +6.0548247E+00$       SIGNIFICANCE OF  $R$  = SIGNIFICANT  
 $D = 75$       DEGREES OF FREEDOM = 73  
 $N = 75$       STORAGE CONDITIONS = AMB TEMP/RH      TEST CONDITIONS = AMB TEMP/RH

PARAMETER = STRAIN AT RUPTURE  
 UNIT OF MEASURE = IN/IN  
 0.24      0.32      0.40      0.48      0.56      0.64



STAGE 1. DISCTED MOTOR=0012029.L.R.HYDRO.CH5=2.0 IN/MIN,300 PSI, STRAIN AT RUPT.

Figure 23

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

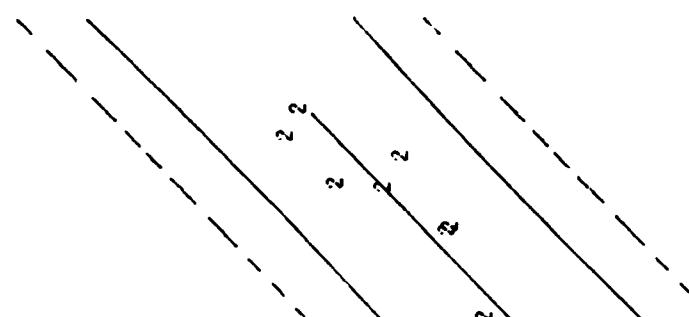
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	12	+3.251622E-01	+3.7264222E-02	+3.9095557E-01	+2.9199999E-01	+3.5221773E-01
235.0	6	+3.9568299E-01	+1.3528494E-02	+4.1999595E-01	+3.8289999E-01	+3.7763726E-01
236.0	12	+3.166630E-01	+5.0952713E-03	+4.0059596E-01	+3.6699998E-01	+3.7879270E-01
246.0	10	+3.673164E-01	+1.0846427E-02	+3.949958E-01	+3.2799994E-01	+3.9034700E-01
247.0	9	+3.0177740E-01	+1.4617947E-02	+4.0399598E-01	+3.5699999E-01	+3.9150243E-01
254.0	9	+4.0422195E-01	+1.5758078E-02	+4.2799597E-01	+3.7699997E-01	+3.9959049E-01
259.0	8	+3.5737474E-01	+1.0405715E-02	+4.2099594E-01	+3.6999994E-01	+4.0536767E-01
266.0	9	+4.3044354E-01	+4.1637557E-02	+4.8799597E-01	+3.8299995E-01	+4.1345572E-01

STAGE 1, DISCTED MCTCR=0012029, L.R. HYDRC•CHS=2.0 IN/MIN, 800 PSI, STRAIN AT RUPT.

$F = +6.1393397E+01$        $Y = 11 -4.2540371E+01$        $1 + 1.3900279E-01$        $1 * X$   
 $R = +6.7566353E-01$       SIGNIFICANCE OF F = SIGNIFICANT  
 $S_f = +1.0197353E-01$       SIGNIFICANCE OF R = SIGNIFICANT  
 $\chi^2 = +7.03553938E+00$       SIGNIFICANCE OF  $\chi^2$  = SIGNIFICANT  
 $D.F. = 73$       DEGREES OF FREEDOM = 73  
 $N = 75$       STORAGE CONDITIONS = AMB TEMP/RH

TEST CONDITIONS = AMB TEMP/RH

PARAMETER = STRESS AT RUPTURE  
 UNIT OF MEASURE = PSI  
 0.00 4.00 8.00 12.00 16.00 20.00 24.00 28.00  
 80.00 120.00 150.00 200.00 240.00 280.00



STAGE 1. DISCETED MOTOR=001;2029.L.R.HYDRO.CHS=2.0 IN/MIN,300 PSI,STRESS AT RUPT.

Figure 24

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	12	+1.3193408E+02	+2.0169370E+01	+1.5569599E+02	+9.6709991E+01	+1.2764721E+02
235.0	6	+1.3593489E+02	+1.7066997E+01	+1.6350000E+02	+1.2739999E+02	+1.4522528E+02
236.0	12	+1.3515992E+02	+9.5426816E+00	+1.5465595E+02	+1.2869999E+02	+1.4602427E+02
246.0	10	+1.5335690E+02	+1.3090756E+01	+1.6879598E+02	+1.2209999E+02	+1.5401431E+02
247.0	9	+1.6341099E+02	+1.0545594E+01	+1.7539599E+02	+1.4339999E+02	+1.5481330E+02
254.0	9	+1.4564102E+02	+9.0536017E+00	+1.7119599E+02	+1.4073999E+02	+1.6040632E+02
259.0	8	+1.7355990E+02	+1.0912835E+01	+1.8939599E+02	+1.5709999E+02	+1.6440133E+02
266.0	9	+1.7126660E+02	+9.7300160E+00	+1.8739559E+02	+1.5969999E+02	+1.6999436E+02

STAGE 1. DISCTED ACTOR=0012029. L.R.HYDRC.CHS=2.0 IN/MIN.800 PSI. STRESS AT RUPT.

$F = +1.5903656E+00$        $Y = (1 + 6.1678546E+02) + ( + 7.0861022E-01) * X)$   
 $R = +1.4601914E-01$       SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $S = +1.2611049E+00$       SIGNIFICANCE OF R = NOT SIGNIFICANT  
 $N = 75$       SIGNIFICANCE OF S = NOT SIGNIFICANT  
 $D = 73$       DEGREES OF FREEDOM = 73  
 STORAGE CONDITIONS = AMB TEMP/RH      TEST CONDITIONS = AMB TEMP/RH

UNIT OF MEASURE = PSI      \*10.  
 PARAMETER = MODULUS

STAGE 1, DISCDED MOTOR=0012029, L.R.HYDRO.CHS=2.0 IN/MIN,800 PSI,MODULUS

Figure 25

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	12	+7.650000E+02	+6.5682431E+01	+8.9900000E+02	+6.6700000E+02	+7.6771923E+02
235.0	6	+7.30225E+02	+8.2055804E+01	+8.7300000E+02	+6.5500000E+02	+7.8330883E+02
236.0	12	+7.3083225E+02	+5.0072371E+01	+8.2500000E+02	+6.5900000E+02	+7.8401733E+02
246.0	10	+8.6185990E+02	+3.6668030E+01	+9.2200000E+02	+8.0500000E+02	+7.9110351E+02
247.0	9	+8.4666650E+02	+9.2687647E+01	+9.6400000E+02	+6.7900000E+02	+7.9181201E+02
254.0	9	+7.1766650E+02	+3.5281038E+01	+7.8200000E+02	+6.7000000E+02	+7.9677221E+02
259.0	8	+8.6412600E+02	+4.5575481E+01	+9.1400000E+02	+7.4600000E+02	+8.0031542E+02
266.0	9	+7.8622216E+02	+5.5346133E+01	+9.1100000E+02	+7.0900000E+02	+8.0527563E+02

- STAGE 1. DISCTED MCTGR=0012029, L.R.HYDRC.CHS=2.0 IN/MIN,800 PSI,MODULUS

$F = +1.2402181E+01$        $Y = (( +1.8450678E-01 ) + ( +6.7824163E-04 ) * X)$   
 $R = +4.0827021E-01$       SIGNIFICANCE OF F = SIGNIFICANT  
 $t = +3.5216731E+00$       SIGNIFICANCE OF R = SIGNIFICANT  
 $N = 64$       SIGNIFICANCE OF  $t$  = SIGNIFICANT  
 DEGREES OF FREEDOM = 62      TEST CONDITIONS = AMB TEMP/RH  
 STORAGE CONDITIONS = AMB TEMP/RH

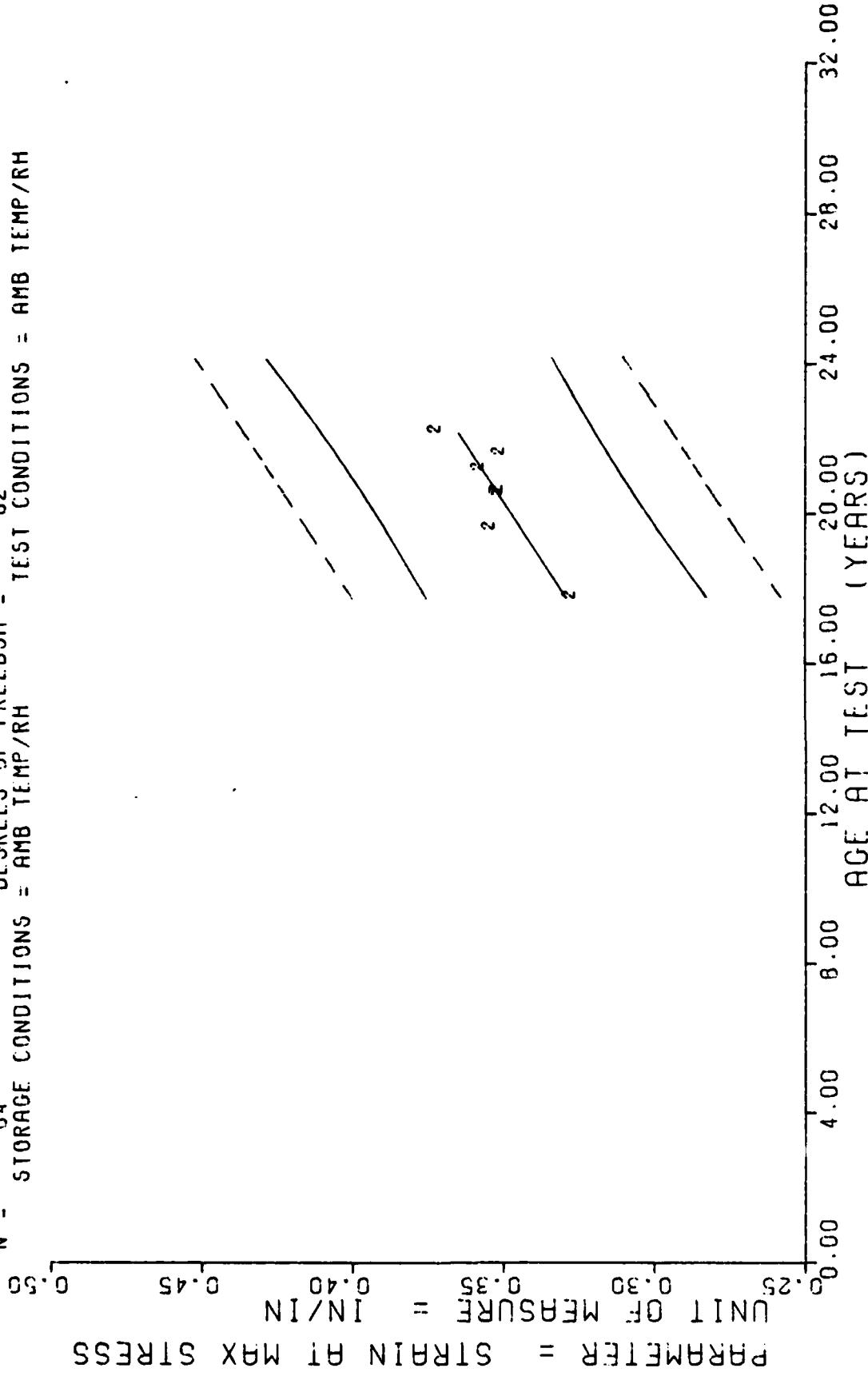


Figure 26

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	8	+3.2637465E-01	+2.2336733E-02	+3.4396598E-01	+2.8699954E-01	+3. 2697222E-01
235.0	7	+3.5306533E-01	+3.5581304E-02	+4.1999995E-01	+3.2299995E-01	+3. 4389352E-01
246.0	7	+3.5057121E-01	+3.1465518E-02	+3.7855594E-01	+2.8299999E-01	+3. 5135418E-01
247.0	9	+3.5044413E-01	+1.4105237E-02	+3.7159597E-01	+3.3399999E-01	+3. 5203242E-01
254.0	18	+3.5672181E-01	+2.6456686E-02	+3.9665555E-01	+3.1959959E-01	+3. 5678011E-01
259.0	7	+3.4557093E-01	+5.6761962E-03	+3.5499555E-01	+3.3879995E-01	+3. 6017131E-01
266.0	8	+3.7055557E-01	+5.519927E-03	+3.77999556E-01	+3.6099994E-01	+3. 6491900E-01

STAGE 1, DSCT MOTCR=0012029, L.R.HYDRO.CHS=20.0 IN/MIN, 200 PSI, STRAIN MAX SYRS.

$F = +1.9674716E+01$   
 $R = +4.9080663E-01$   
 $I = +4.4356190E+00$   
 $N = 64$   
 $Y = (( -7.9562603E+01 ) + ( +1.2016477E+00 ) * X) / ( +1.2016477E+00 ) * X)$   
 $F = \text{SIGNIFICANCE OF } F$   
 $R = \text{SIGNIFICANCE OF } R$   
 $I = \text{SIGNIFICANCE OF } I$   
 $N = \text{DEGREES OF FREEDOM} = 62$   
 $\text{STORAGE CONDITIONS} = \text{AMB TEMP/RH}$

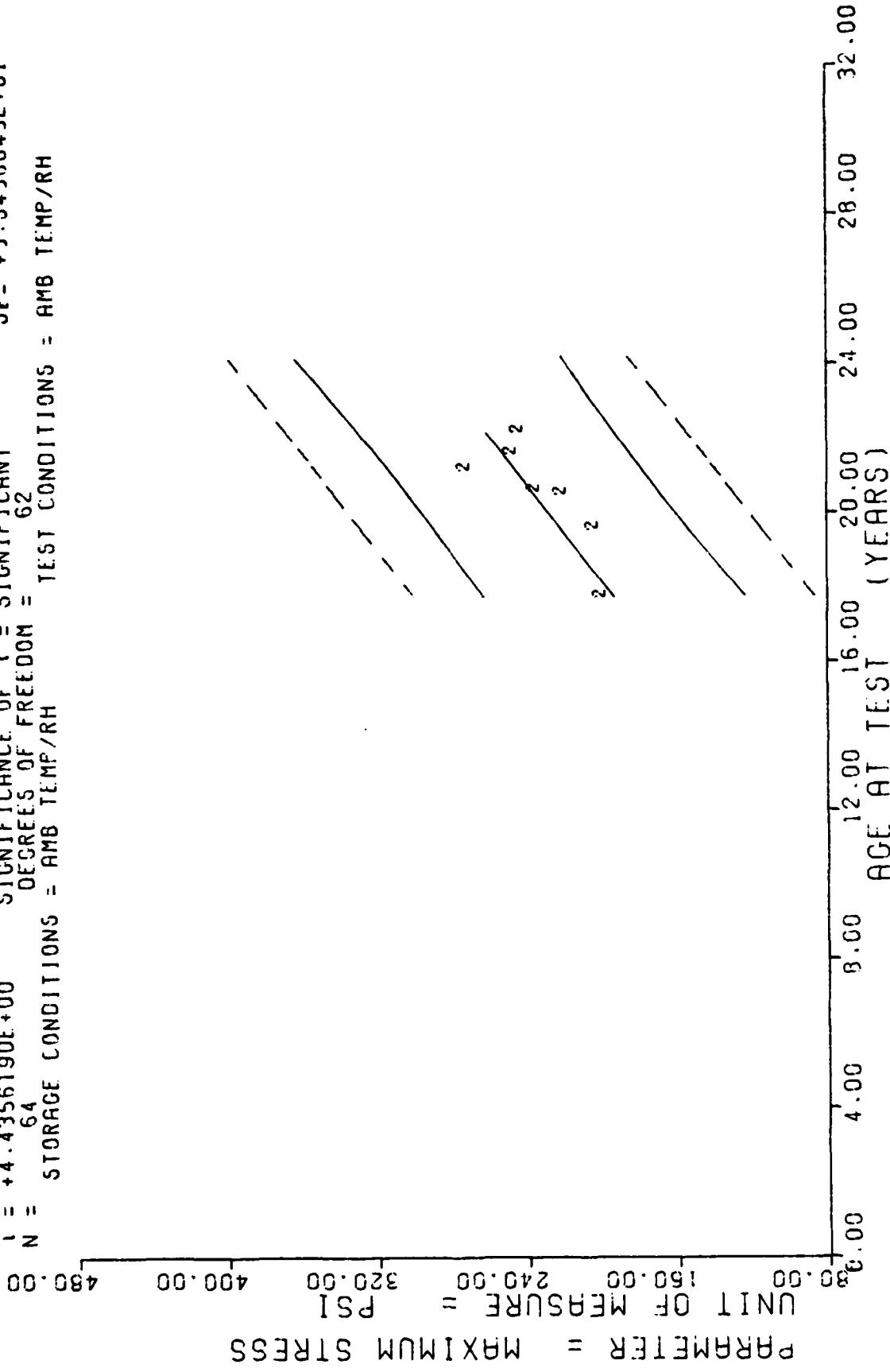


Figure 27

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	8	+1.5655612E+02	+3.7544142E+00	+2.0375599E+02	+1.9363999E+02	+1.9342837E+02
235.0	7	+2.0212845E+02	+6.2755282E+00	+2.1009599E+02	+1.9329998E+02	+2.2162461E+02
246.0	7	+2.1516560E+02	+8.9451638E+00	+2.2889599E+02	+2.0879998E+02	+2.3512274E+02
247.0	9	+2.3328210E+02	+1.2087341E+01	+2.5825580E+02	+2.1839999E+02	+2.3700439E+02
254.0	18	+2.7059667E+02	+5.6616256E+01	+3.4750000E+02	+2.1050000E+02	+2.4597592E+02
259.0	7	+2.4601136E+02	+1.1229821E+01	+2.6711587E+02	+2.3659999E+02	+2.5238417E+02
266.0	8	+2.4211364E+02	+1.45941450E+01	+2.6956557E+02	+2.2559999E+02	+2.61355546E+02

STAGE 1. DSCT1 MCTCR=0012029, L.R.=HYCFO, CHS=20.0 IN/MIN, 800 PSI, MAX STRS.

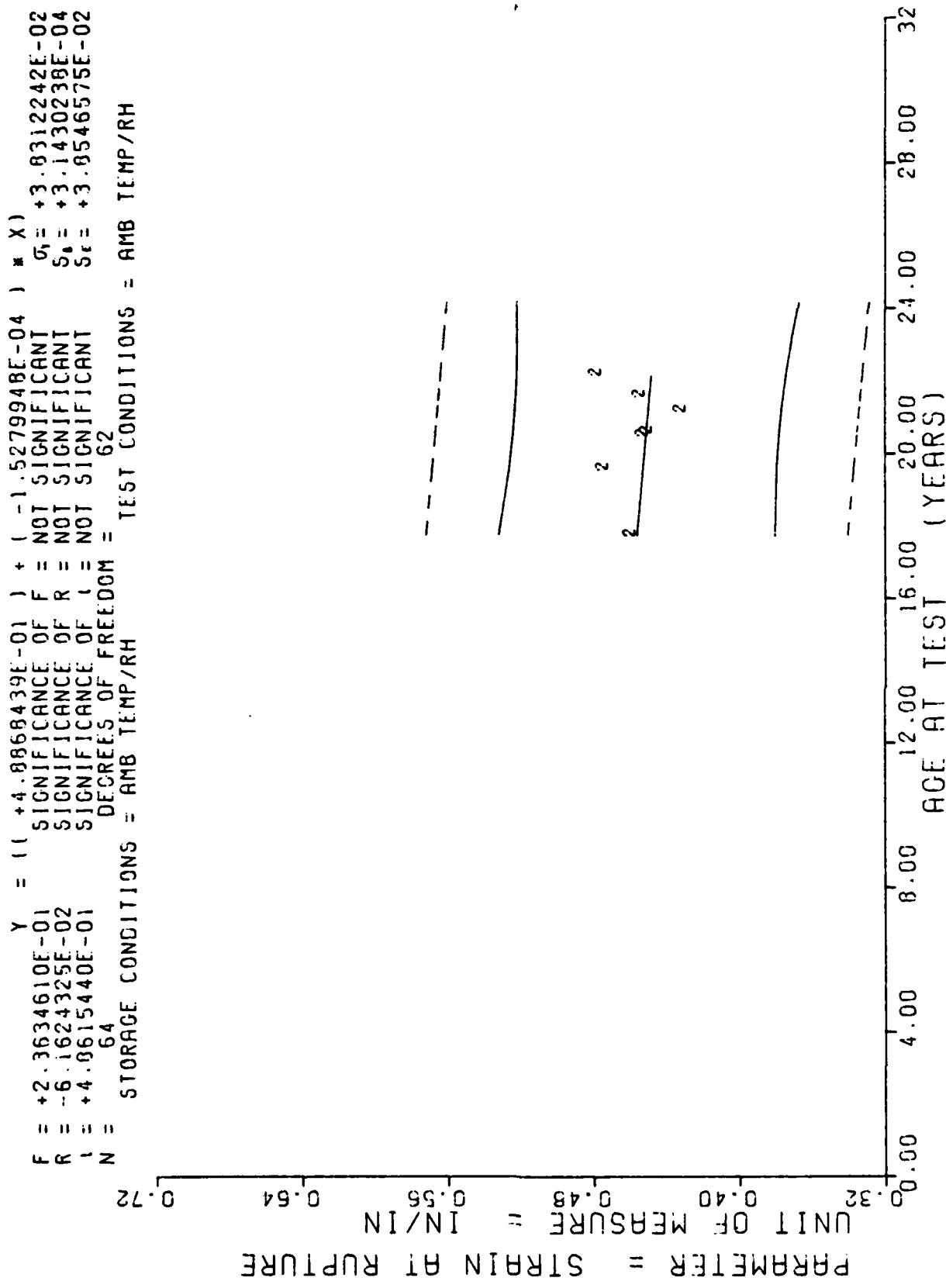


Figure 28

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	8	+4.5737457E-01	+3.2749507E-02	+5.0959599E-01	+4.1399997E-01	+4.5613807E-01
235.0	7	+4.7226527E-01	+5.2665646E-02	+5.6699597E-01	+4.1999995E-01	+4.5277649E-01
246.0	7	+4.5042800E-01	+3.0811373E-02	+4.8059594E-01	+3.8699996E-01	+4.5109570E-01
247.0	9	+4.4822189E-01	+1.5245718E-02	+4.7099595E-01	+4.1899996E-01	+4.5094287E-01
254.0	18	+4.2572737E-01	+4.6219355E-02	+4.8299598E-01	+2.9799957E-01	+4.4987332E-01
259.0	7	+4.6221394E-01	+1.6546126E-02	+4.8499595E-01	+4.2249995E-01	+4.4910931E-01
266.0	8	+4.755719E-01	+1.1310581E-02	+4.6899996E-01	+4.5699995E-01	+4.4803971E-01

STAGE 1, DSCT MCTCF=0012029, L.R.HYDRO.C+S=20.0 IN/MIN. 600 PSI, STRAIN AT RUPT.

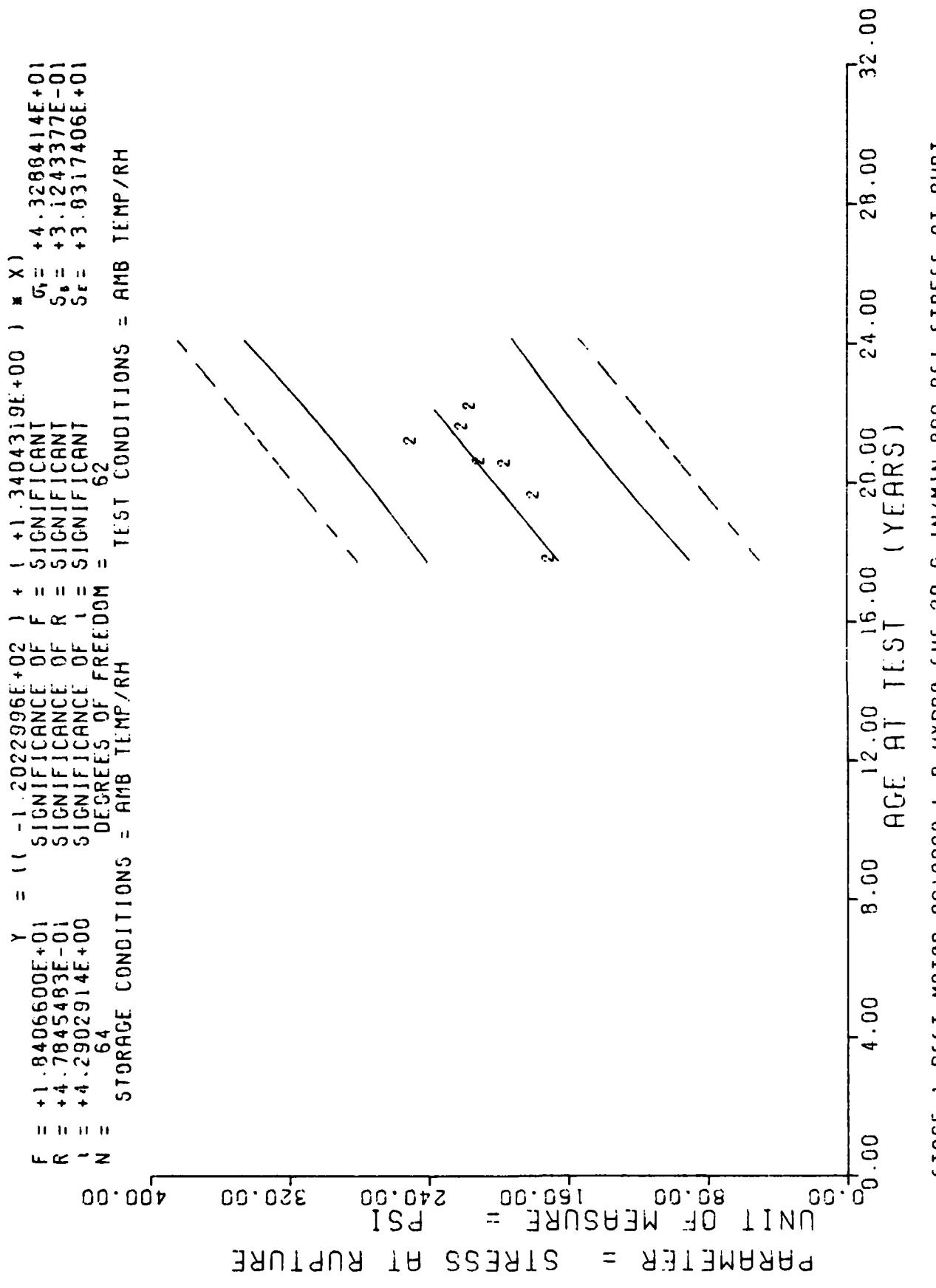


Figure 29

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

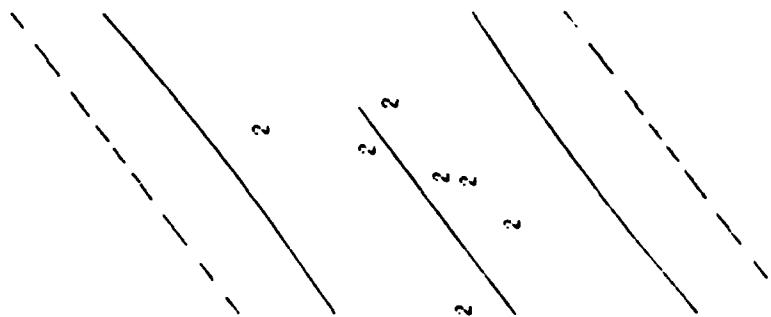
\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	8	+1.6818615E+02	+3.6794727E+00	+1.7569599E+02	+1.6300000E+02	+1.6528202E+02
235.0	7	+1.7685849E+02	+1.2792456E+01	+1.9088699E+02	+1.5700000E+02	+1.9477153E+02
246.0	7	+1.9241423E+02	+1.3357652E+01	+2.0589599E+02	+1.7469959E+02	+2.0951629E+02
247.0	9	+2.0784431E+02	+1.1074458E+01	+2.2439599E+02	+1.9169999E+02	+2.1085671E+02
254.0	18	+2.4735069E+02	+6.0891132E+01	+3.2555855E+02	+1.8009999E+02	+2.2023974E+02
259.0	7	+2.1756992E+02	+1.2806245E+01	+2.3498559E+02	+1.9679998E+02	+2.2654189E+02
266.0	8	+2.1338742E+02	+1.5581729E+01	+2.4329598E+02	+2.0069999E+02	+2.3632492E+02

STAGE 1, DSC1 MCTCF=0012029, L.R.HYDRO.CHS=20.0 IN/MIN, 800 PSI, STRESS AT RUPT.

$F = +1.5490913E+01$        $Y = 11 -3.7539164E+02$        $! = 1 +6.2699478E+00$        $! * X !$   
 $R = +4.4710870E-01$       SIGNIFICANCE OF  $F$  = SIGNIFICANT  
 $S_r = +1.5930353E+00$       SIGNIFICANCE OF  $R$  = SIGNIFICANT  
 $S_e = +1.9537255E+02$       SIGNIFICANCE OF  $! =$  SIGNIFICANT  
 $N = 64$       DEGREES OF FREEDOM = 62  
 $N =$       STORAGE CONDITIONS = AMB TEMP/RH      TEST CONDITIONS = AMB TEMP/RH

UNIT OF MEASURE = PSI       $* 10^3$   
 PARAMETER = MODULUS



STAGE 1. DISC10 MOTOR=0012029.1.R.HYDR CHS=20.0 IN/MIN, 800 PSI, MODULUS

Figure 30

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\*\* ANALYSIS OF TIME SERIES \*\*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIAITON	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	8	+1.0551250E+03	+1.1267835E+02	+1.2530000E+03	+9.3600000E+02	+9.6010717E+02
235.0	7	+9.6142846E+02	+1.3602800E+02	+1.1450000E+03	+7.8900000E+02	+1.0980458E+03
246.0	7	+1.0454284E+03	+1.0083791E+02	+1.2510000E+03	+9.2100000E+02	+1.1670153E+03
247.0	9	+1.1030000E+03	+7.1747822E+01	+1.2600000E+03	+1.0360000E+03	+1.1732854E+03
254.0	18	+1.2555566E+03	+2.5247128E+02	+1.6910000E+03	+9.8600000E+02	+1.2171750E+03
259.0	7	+1.4844284E+03	+1.3173060E+02	+1.6350000E+03	+1.3000000E+03	+1.2485246E+03
266.0	8	+1.2105750E+03	+6.7632277E+01	+1.3150000E+03	+1.1120000E+03	+1.2924147E+03

STAGE 1, DISCTED MCTCR=0012029, L.R.HYDR CHS=20.0 IN/MIN, 800 PSI, MODULUS

$F = +3.4080666E+00$        $Y = 11 + 4.9454741E-01$        $+ (-7.4711441E-04) * X_1$   
 $R = -2.9041564E-01$       SIGNIFICANCE OF  $F = \text{NOT SIGNIFICANT}$        $G_1 = +2.9407222E-02$   
 $^1 = +1.0460949E+00$       SIGNIFICANCE OF  $R = \text{NOT SIGNIFICANT}$        $S_0 = +4.0469987E-04$   
 $N = 39$       SIGNIFICANCE OF  $^1 = \text{NOT SIGNIFICANT}$        $S_1 = +2.0517520E-02$   
 $\text{DEGREES OF FREEDOM} = 37$       TEST CONDITIONS = 30 DEC F.  
 $\text{STORAGE CONDITIONS} = \text{AMB TEMP/RH}$

PARAMETER = STRAIN AT MAX STRESS

0.19 0.24 0.29 0.34 0.39 0.44  
UNIT OF MEASURE = IN/IN

STAGE 1, DISC TFD MOTOR=0012029, L.R. HYDRO. CHS=2.0 IN/MIN, 800 PSI, STRAIN MAX STBS

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

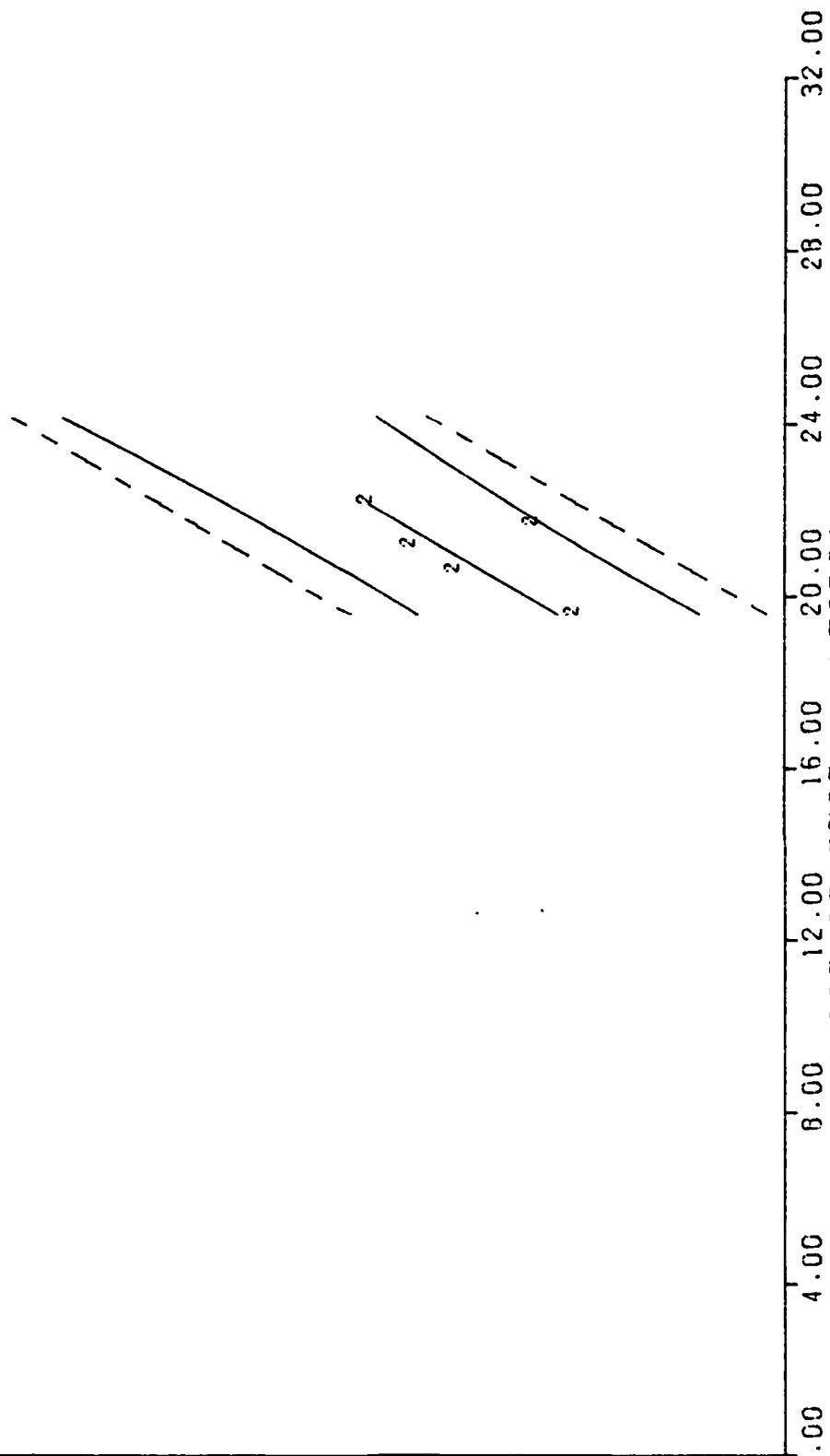
\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
235.0	10	+3.2235956E-01	+9.0037214E-03	+3.3059456E-01	+3.0619998E-01	+3.1897550E-01
247.0	9	+3.2144397E-01	+2.7943215E-02	+3.8599997E-01	+2.9099994E-01	+3.1001013E-01
254.0	9	+2.7725519E-01	+4.0649916E-02	+3.1999999E-01	+1.8419998E-01	+3.0478030E-01
260.0	2	+2.9674994E-01	+1.1667394E-02	+3.0499994E-01	+2.8849995E-01	+3.0029761E-01
266.0	5	+3.0882312E-01	+8.2948206E-03	+3.2269956E-01	+2.9899996E-01	+2.9581493E-01

STAGE 1, DISCTED MATOR=0012029, L.R.HYDRC.CHS=2.0 IN/MIN,800 PSI, STRAIN MAX STRS.

$F = +3.9565948E+01$        $Y = ( ( -3.4561457E+02 ) + ( +2.8513146E+00 ) * X )$   
 $R = +7.1885774E-01$       SIGNIFICANCE OF  $F$  = SIGNIFICANT  
 $1 = +6.2901469E+00$       SIGNIFICANCE OF  $R$  = SIGNIFICANT  
 $N = 39$       SIGNIFICANCE OF  $1$  = SIGNIFICANT  
DEGREES OF FREEDOM = 37      TEST CONDITIONS = 30 DEG F.

PARAMETER = MAXIMUM STRESS  
UNIT OF MEASURE = PSI  
200.00 300.00 380.00 450.00 540.00  
0.00 4.00 8.00 12.00 16.00 20.00 24.00 28.00 32.00



STAGE 1 DISCTED MOTOR=0012029, L. R. HYDRO. CHS=2.0 IN/MIN, 800 PSI, MAX STRS

Figure 32

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
235.0	10	+3.1540566E+02	+2.2379994E+01	+3.6186587E+02	+2.9401977E+02	+3.2424414E+02
247.0	9	+3.7072315E+02	+2.7619356E+01	+4.1000000E+02	+3.3000000E+02	+3.5845996E+02
254.0	9	+3.5105204E+02	+4.2242700E+01	+4.6150000E+02	+3.2903979E+02	+3.7841918E+02
260.0	2	+3.3475580E+02	+8.2055216E+00	+3.4059585E+02	+3.2900000E+02	+3.9552709E+02
266.0	9	+4.1055575E+02	+1.5069016E+01	+4.4400000E+02	+3.9759985E+02	+4.1263500E+02

STAGE 1, DISCTED MCTCR=0012029, L.R.HYDRC•CHS=2.0 IN/MIN.800 PSI, MAX STRS.

$F = +2.8637594E+00$        $Y = ( ( +4.7680832E-01 ) + ( -5.1670160E-04 ) * X )$   
 $R = -2.6802736E-01$        $\sigma_f = +2.2036750E-02$   
 $1 = +1.6922645E+00$        $S_f = +3.0533145E-04$   
 $N = 39$        $S_r = +2.1515440E-02$   
 $37$       DEGREES OF FREEDOM = 37  
 $STORAGE CONDITIONS = AMB TEMP/RH$       TEST CONDITIONS = 30 DEG F.

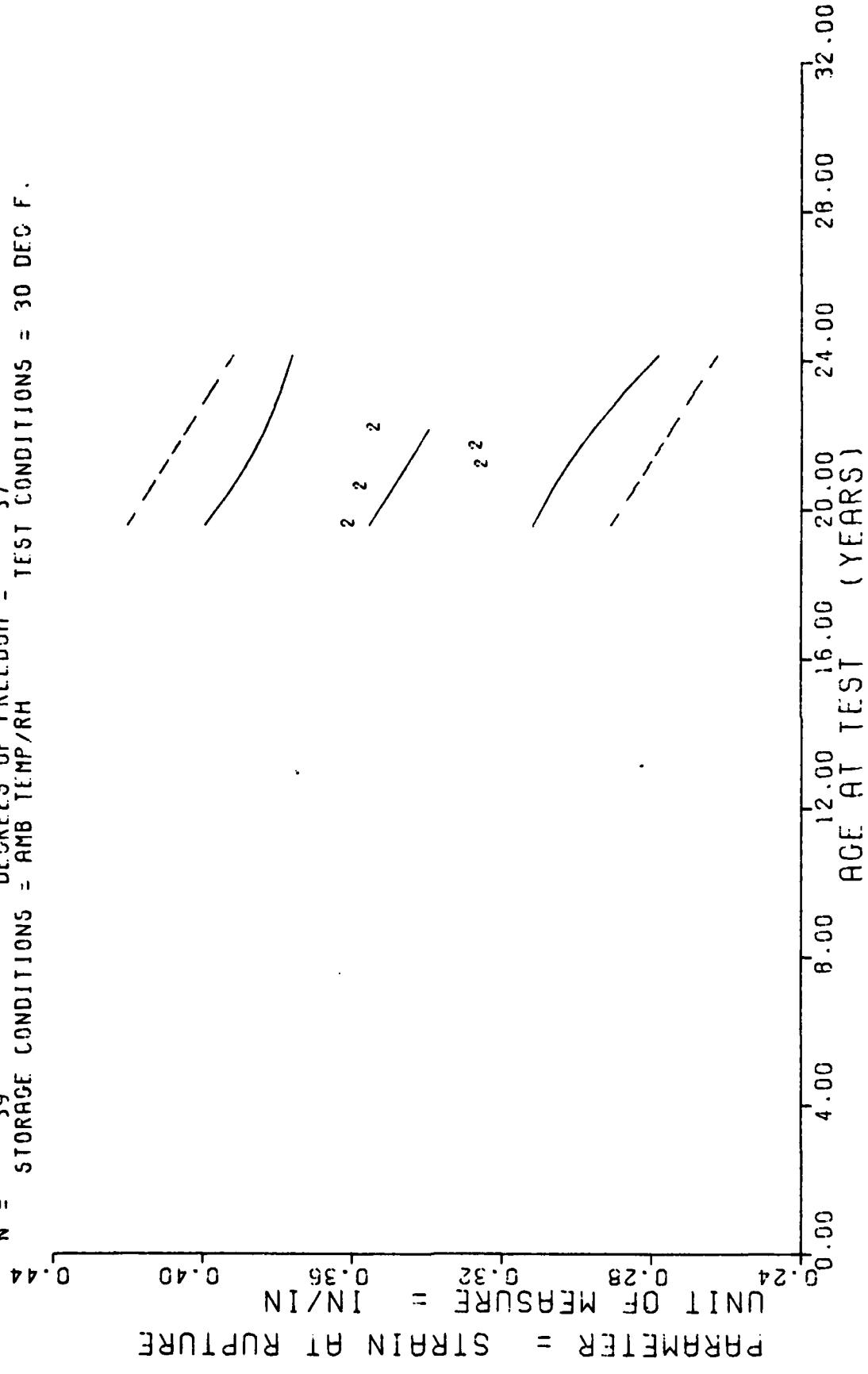


Figure 33

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

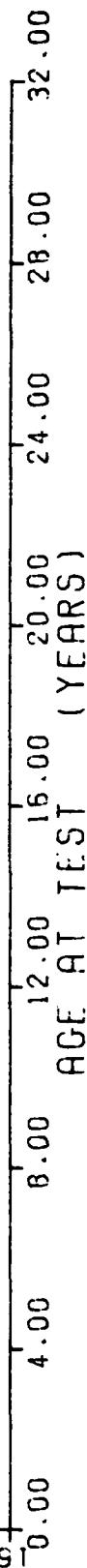
\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
235.0	10	+3.059E7956E-01	+1.04465885E-02	+3.05279557E-01	+3.04129995E-01	+3.05538339E-01
247.0	9	+3.056E34398E-01	+1.07425748E-02	+3.07899594E-01	+3.02799954E-01	+3.04918302E-01
254.0	9	+3.02406634E-01	+2.01270334E-02	+3.05295558E-01	+2.07799959E-01	+3.04556609E-01
265.0	2	+3.02545995E-01	+2.01226620E-03	+3.02699556E-01	+3.02399994E-01	+3.04246587E-01
266.0	9	+3.052E1062E-01	+1.06569597E-02	+3.07599598E-01	+3.02309997E-01	+3.03936566E-01

STAGE 1, DISCTED MCTCR=0012029, L.R.HYDRC.CHS=2.0 IN/MIN, 800 PSI. STRAIN AT RUPT.

$F = +4.3266458E+01$   
 $R = +7.3419026E-01$   
 $I = +6.5777243E+00$   
 $N = 39$   
 $Y = 11 - 3.6764032E+02$   
 $\sigma_1 = +2.962463E+00$   
 $\sigma_2 = +4.4567490E+01$   
 $S_1 = +4.3517529E-01$   
 $S_2 = +3.0664996E+01$   
 $S_{12} =$   
 $\text{SIGNIFICANCE OF } F = \text{SIGNIFICANT}$   
 $\text{SIGNIFICANCE OF } R = \text{SIGNIFICANT}$   
 $\text{SIGNIFICANCE OF } I = \text{SIGNIFICANT}$   
 $\text{DEGREES OF FREEDOM} = 37$   
 $\text{STORAGE CONDITIONS} = \text{AMB TEMP/RH}$   
 $\text{TEST CONDITIONS} = 30 \text{ DEG F.}$

$\text{PARAMETER} = \text{STRESS AT RUPTURE}$   
 $\text{UNIT OF MEASURE} = \text{PSI}$   
 $0.00 \quad 40.00 \quad 80.00 \quad 120.00 \quad 160.00 \quad 200.00 \quad 240.00 \quad 280.00 \quad 320.00$



STAGE 1. DISCITED MOTOR=0012029. I. R. HYDRO. CHS=2.0 IN/MIN. 800 PSI. STRESS AT RUPT.

Figure 34

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
235.0	10	+2.5712475E+02	+2.5230160E+01	+3.5258959E+02	+2.6950000E+02	+3.0501833E+02
247.0	9	+3.4955419E+02	+2.8339622E+01	+3.8629580E+02	+3.0729980E+02	+3.3938793E+02
254.0	9	+3.7153759E+02	+3.5935537E+01	+4.3985590E+02	+3.1335986E+02	+3.5942529E+02
264.0	2	+3.2714590E+02	+2.0634420E+00	+3.2855585E+02	+3.2569995E+02	+3.7660009E+02
266.0	9	+3.9127758E+02	+1.6011241E+01	+4.3125580E+02	+3.7609985E+02	+3.9377465E+02

STAGE 1, DISCTED MCTQR=0012329, L.R.HYDRC.CHS=2.0 IN/MIN,800 PSI,STRESS AT RUPT.

$F = +2.502013iE+01$        $Y = (( -4.7485575E+03 ) + ( +2.6261463E+01 ) * X)$   
 $R = +6.3515314E-01$       SIGNIFICANCE OF  $F$  = SIGNIFICANT  
 $S = +5.0020127E+00$       SIGNIFICANCE OF  $R$  = SIGNIFICANT  
 $t = +5.000E+00$       SIGNIFICANCE OF  $t$  = SIGNIFICANT  
 $1 = 39$       DEGREES OF FREEDOM = 37  
 $N = 37$       STORAGE CONDITIONS = AMB TEMP/RH      TEST CONDITIONS = 30 DEC F.

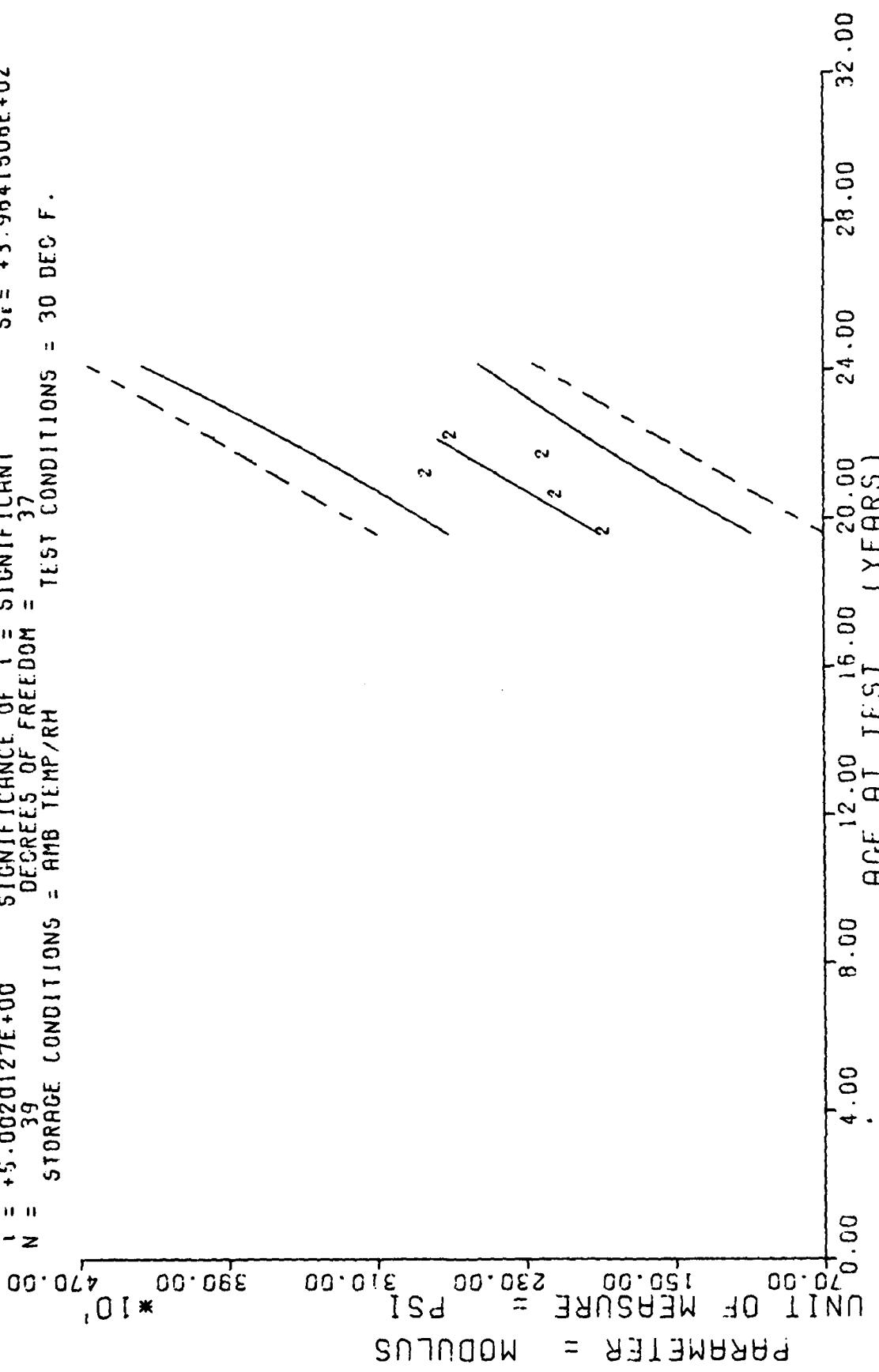


Figure 35

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

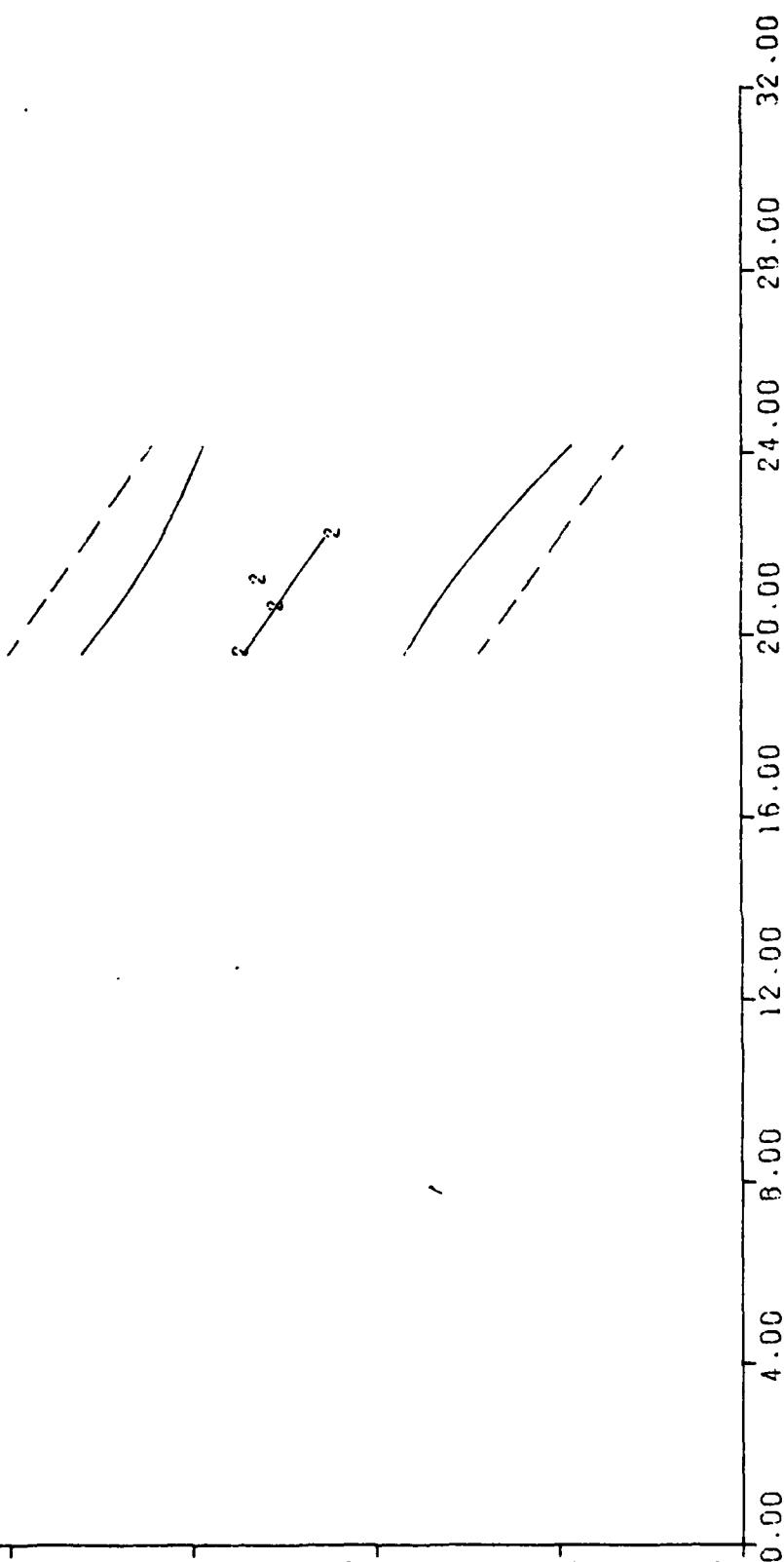
\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
235.0	10	+1.8546599E+03	+2.3093219E+02	+2.2170600E+03	+1.5670000E+03	+1.8975861E+03
247.0	9	+2.1102221E+03	+2.7644247E+02	+2.5290000E+03	+1.7810000E+03	+2.2369638E+03
254.0	9	+2.8062221E+03	+5.6310074E+02	+3.7330000E+03	+2.0930000E+03	+2.4349340E+03
260.0	2	+2.1770000E+03	+2.0081832E+02	+2.3190000E+03	+2.0350000E+03	+2.6046228E+03
266.0	9	+2.6724443E+03	+2.0675535E+02	+2.9650000E+03	+2.3990000E+03	+2.7743117E+03

STAGE 1. DISCTED MATOR=0012029, L.R. HYDRC.CHS=2.0 IN/MIN, 800 PSI. MODULUS

$F = +5.0079771E+00$        $Y = (( +4.0289468E-01 ) + ( -5.7116845E-04 ) * X)$   
 $R = -3.6298927E-01$        $F = \text{SIGNIFICANT}$   
 $R = -3.6298927E-01$        $F = \text{NOT SIGNIFICANT}$   
 $R = +2.2378510E+00$        $R = \text{NOT SIGNIFICANT}$   
 $1 = 35$        $1 = \text{NOT SIGNIFICANT}$   
 $N = 35$        $33$   
 $\text{DEGREES OF FREEDOM} = \text{STORAGE CONDITIONS} = \text{AMB TEMP/RH}$

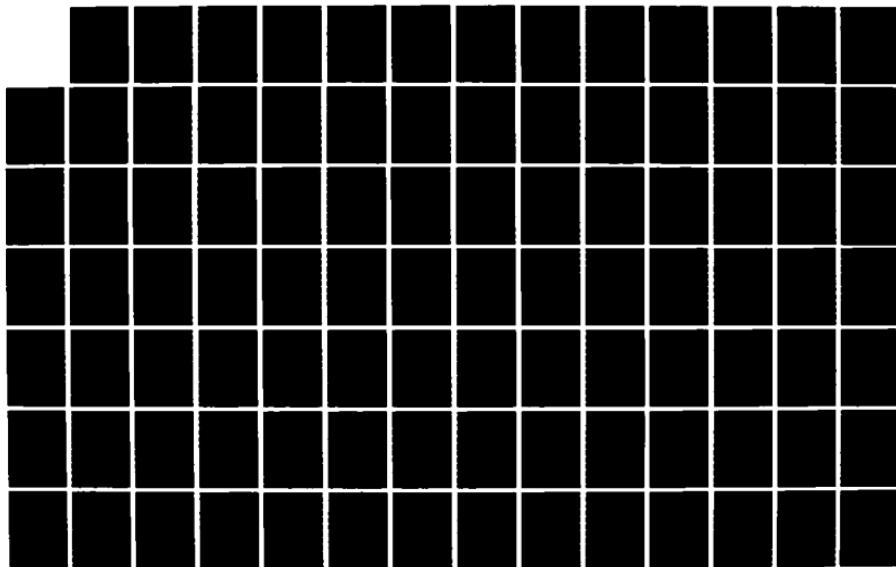
$\text{PARAMETER} = \text{STRAIN AT MAX STRESS}$   
 $\text{UNIT OF MEASURE} = \text{IN/IN}$   
 $0.00 \quad 4.00 \quad 8.00 \quad 12.00 \quad 16.00 \quad 20.00 \quad 24.00 \quad 28.00 \quad 32.00$

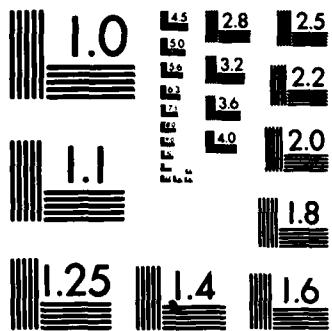


STAGE 1, DSCT MOTOR=09112029, L.R.HYDRO.CHS=20.0 IN/MIN, 800 PSI, STRAIN MAX STRS.

Figure 36

AD-A171 132 SURVEILLANCE REPORT STAGE I DISSECTED MOTOR/PROPELLANT 2/3  
MOTOR NUMBER 8812029(U) OGDEN AIR LOGISTICS CENTER HILL  
AFB UT PROPELLANT ANALYSIS LAB J A THOMPSON FEB 86  
UNCLASSIFIED HQQCP-515(86) F/G 21/8. 2 NL





MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIACTION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
235.0	10	+2.6765577E-01	+5.8496162E-03	+2.9015559E-01	+2.6039959E-01	+2.6867008E-01
247.0	9	+2.6011085E-01	+1.1444662E-02	+2.8599995E-01	+2.4599999E-01	+2.6181602E-01
254.0	8	+2.6398730E-01	+2.6800319E-02	+3.0475557E-01	+2.2799958E-01	+2.5781786E-01
266.0	8	+2.4792468E-01	+1.4799356E-02	+2.6289559E-01	+2.2479959E-01	+2.5096386E-01

STAGE 1.0SCT M0TCF=0012029. L.R.HYDFA.C1-S=20.0 IN/MIN. 600 PSI. STRAIN MAX STRS.

$F = +7.3872646E+00$        $Y = (( +1.2075697E+02 ) + ( +1.5106327E+00 ) * X )$   
 $R = +4.2768065E-01$        $F = \text{SIGNIFICANT}$   
 $1 = +2.7179522E+00$        $R = \text{SIGNIFICANT}$   
 $N = 35$        $1 = \text{SIGNIFICANT}$   
 $\text{STORAGE CONDITIONS} = \text{AMB TEMP/RH}$        $\text{TEST CONDITIONS} = 30 \text{ DEC F.}$   
 $\text{DEGREES OF FREEDOM} = 33$

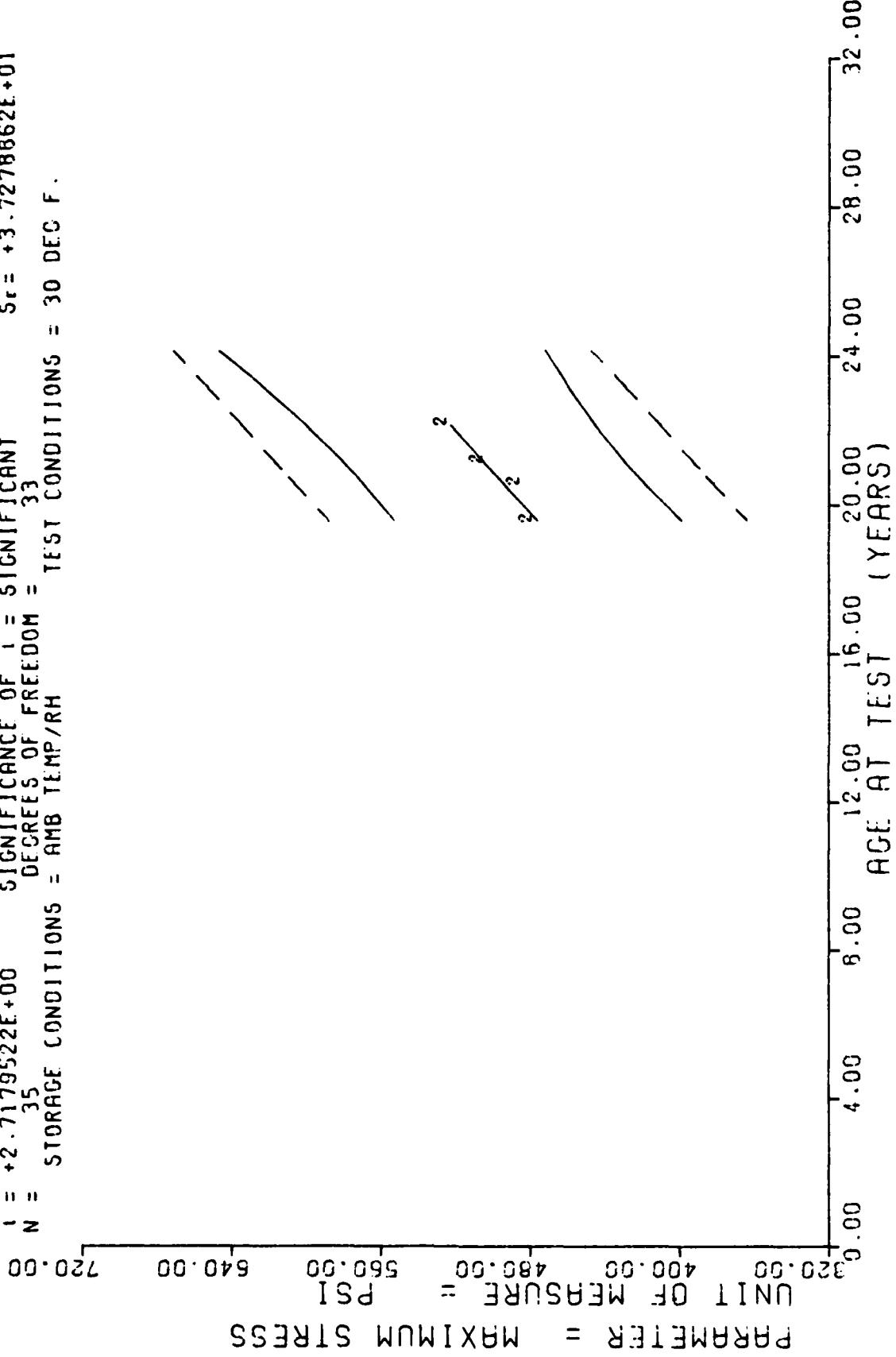


Figure 37

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
235.0	10	+4.7555664E+02	+3.3982486E+01	+5.216955E+02	+4.0835986E+02	+4.7575756E+02
247.0	9	+4.8617749E+02	+2.4297105E+01	+5.2429580E+02	+4.5979980E+02	+4.9388525E+02
254.0	8	+5.0551592E+02	+5.5513817E+01	+5.6700000E+02	+4.1210986E+02	+5.0445947E+02
266.0	8	+5.2504833E+02	+2.7273552E+01	+5.5982583E+02	+4.7879980E+02	+5.2258715E+02

STAGE 1, DSCT MCTCF=0012029, L.R.FY0RD.CHS=20.0 IN/MIN,800 PSI,MAX STAS.

$Y = 11.4180719E-01 + 1.1781196E-04 * X1$   
 $F = 8.5729921E+00$  SIGNIFICANCE OF  $F = \sigma_1 = +2.3248731E-02$   
 $R = 4.5410948E-01$  SIGNIFICANCE OF  $R = \sigma_2 = +3.1346387E-04$   
 $1 = 2.9279672E+00$  SIGNIFICANCE OF  $1 = \sigma_3 = +2.1024858E-02$   
 $N = 35$  DEGREES OF FREEDOM = 33  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 30 DEG F.

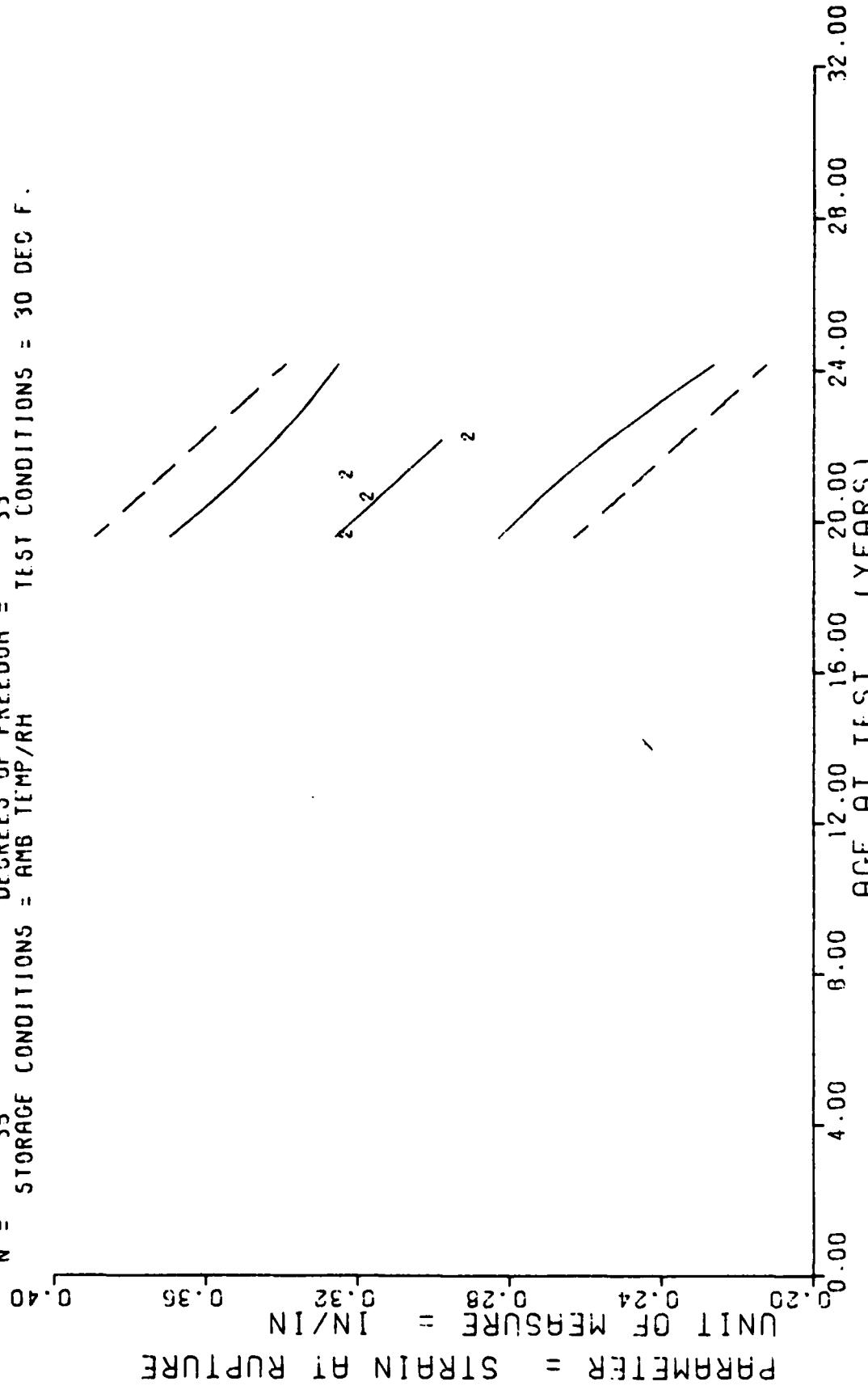


Figure 38

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
235.0	10	+2.2165562E-01	+1.2444526E-02	+3.4839559E-01	+3.0779959E-01	+3.2612133E-01
247.0	9	+3.1595574E-01	+1.7084513E-02	+3.36995595E-01	+2.8999956E-01	+3.1510758E-01
254.0	8	+3.2145546E-01	+3.0813803E-02	+3.73995595E-01	+2.8599995E-01	+3.0868291E-01
266.0	8	+2.85424465E-01	+1.7544401E-02	+3.16995597E-01	+2.7189999E-01	+2.9766917E-01

STAGE 1. DSCT MCTCF=0012029, L.R.HYDRO.CHS=20.0 IN/MIN, 800 PSI. STRAIN AT RUPT.

$F = +6.2396186E+00$        $Y = (1 + 1.4529000E+02) + (1 + 2882880E+00) * X_1$   
 $R = +3.9876463E-01$       SIGNIFICANCE OF  $F = \text{SIGNIFICANT}$        $S_F = +3.7162291E+01$   
 $R^2 = +2.4979228E+00$       SIGNIFICANCE OF  $R = \text{SIGNIFICANT}$        $S_R = +5.1574374E-01$   
 $N = 35$       SIGNIFICANCE OF  $R^2 = \text{SIGNIFICANT}$        $S_{R^2} = +3.4592309E+01$   
 $D = 33$       DEGREES OF FREEDOM = 33  
 STORAGE CONDITIONS = AMB TEMP/RH      TEST CONDITIONS = 30 DEG F.

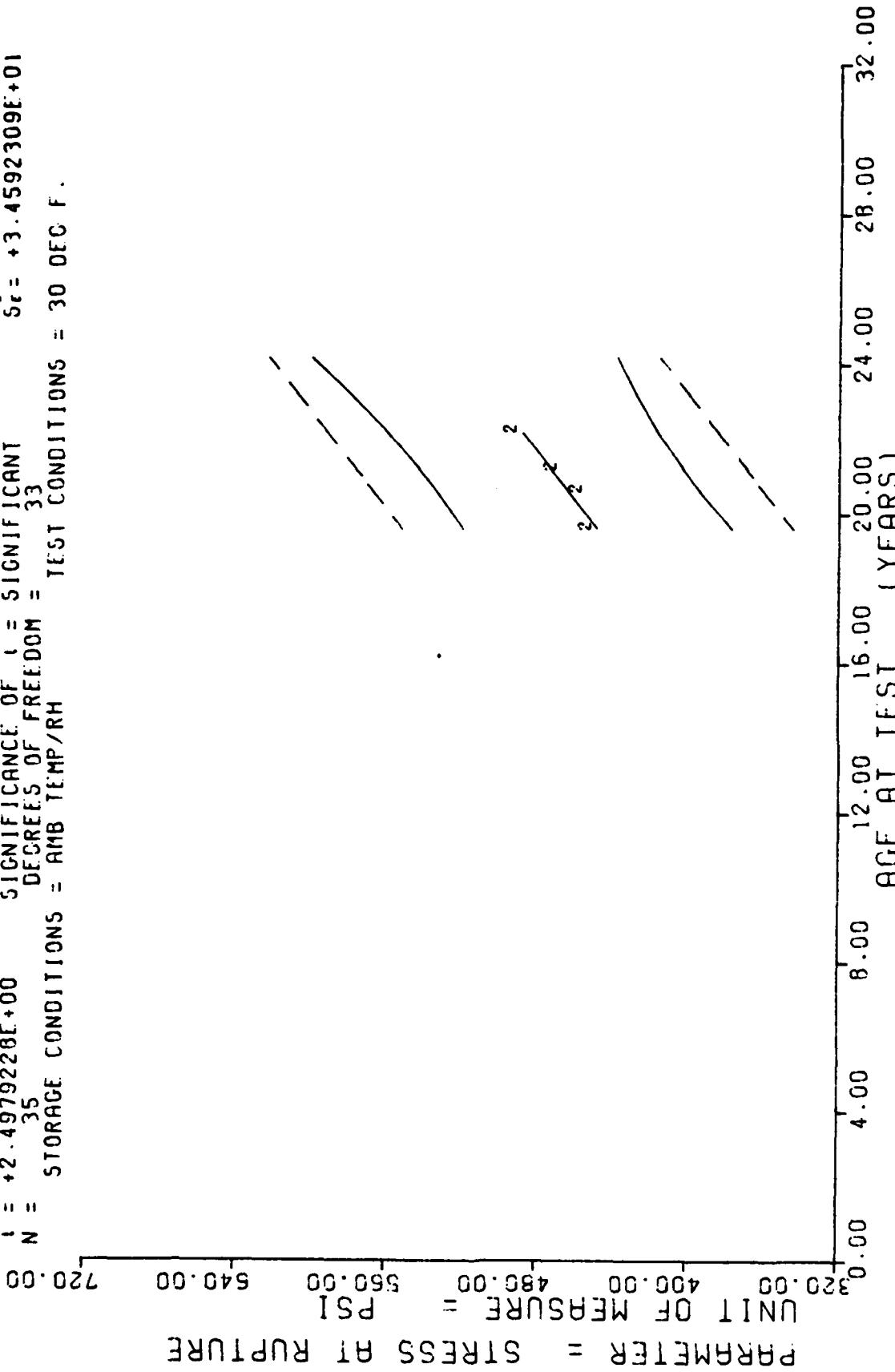


Figure 39

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
235.0	10	+4.5205570E+02	+3.0693379E+01	+4.2606582E+02	+3.0519995E+02	+4.4903759E+02
247.0	9	+4.5706837E+02	+2.5366744E+01	+4.9000000E+02	+4.2409985E+02	+4.6349707E+02
254.0	8	+4.762470E+02	+5.4857455E+01	+5.4719955E+02	+3.8329980E+02	+4.7251513E+02
266.0	6	+4.9180102E+02	+2.4260640E+01	+5.2227578E+02	+4.4405981E+02	+4.8797460E+02

STAGE 1, DSC1 NC1CF=0012029, L.R.HYDFO.CHS=20.0 IN/MIN, 800 PSI, STRESS AT RUPT.

$F = +2.8649511E+01$        $\gamma = ( ( -1.2556768E+04 ) + ( +6.9373265E+01 ) * X )$   
 $R = +6.8170078E-01$       SIGNIFICANCE OF  $F = \text{SIGNIFICANT}$   
 $\nu_1 = +5.3525238E+00$       SIGNIFICANCE OF  $R = \text{SIGNIFICANT}$   
 $N = 35$       SIGNIFICANCE OF  $\nu_1 = \text{SIGNIFICANT}$   
 DEGREES OF FREEDOM = 33  
 STORAGE CONDITIONS = AMB TEMP/RH      TEST CONDITIONS = 30 DEG F.

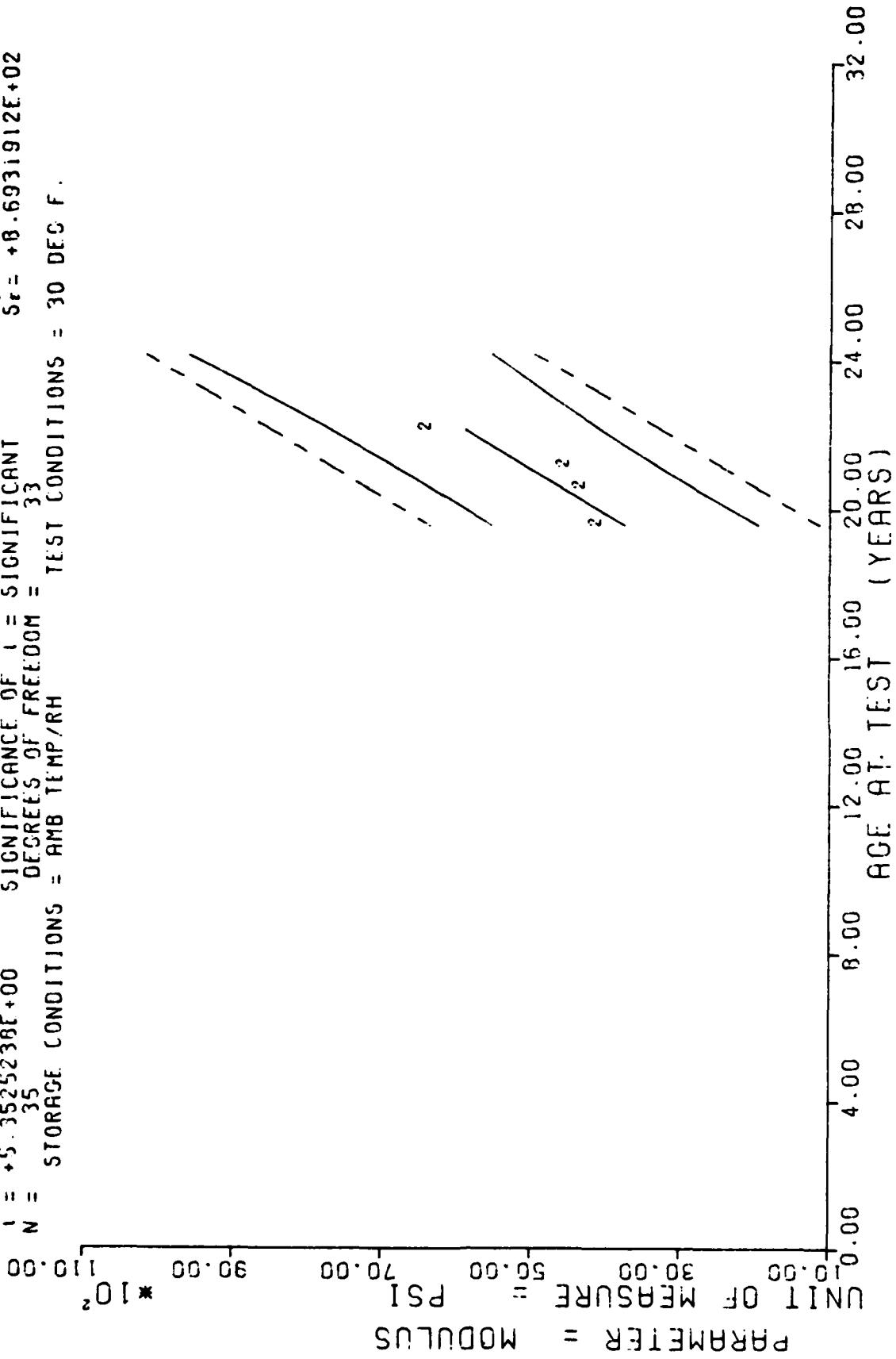


Figure 40

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
235.0	10	+4.075558E+03	+3.7205232E+02	+4.3670000E+03	+3.2260000E+03	+3.7459533E+03
247.0	9	+4.2935546E+03	+3.5798852E+02	+4.8530000E+03	+3.7350000E+03	+4.5784296E+03
254.0	6	+4.5670000E+03	+1.0602894E+03	+5.7440000E+03	+3.1910000E+03	+5.0640429E+03
266.0	8	+6.3620000E+03	+1.1034843E+03	+7.5620000E+03	+4.5600000E+03	+5.6965234E+03

STAGE 1, DISCTED MCTCR=0012029, L.R.HYDR CHS=20.0 IN/MIN, 800 PSI, MODULUS

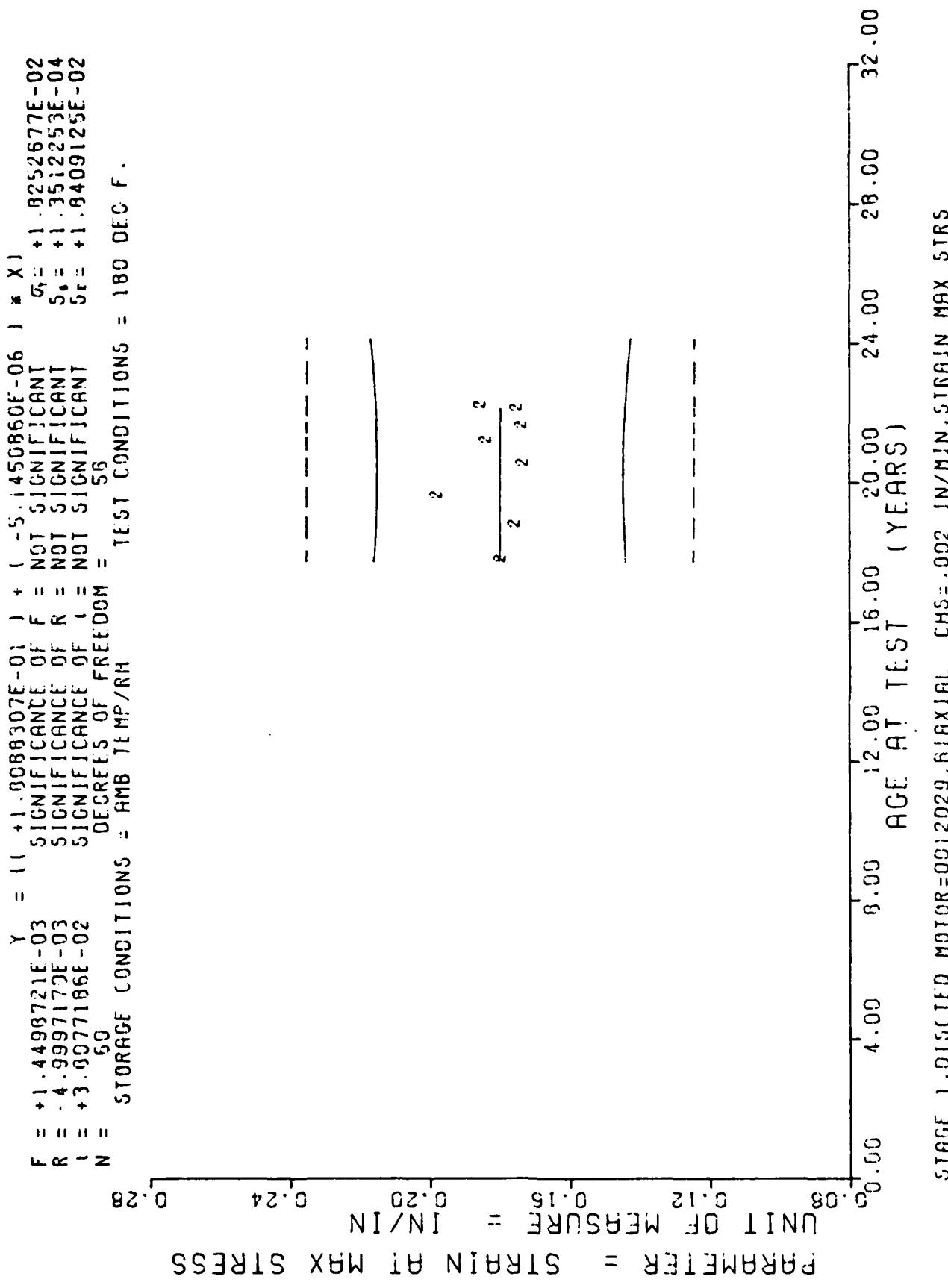


Figure 41

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	8	+1.7624983E-01	+1.7319631E-02	+2.0699555E-01	+1.5099996E-01	+1.7978715E-01
225.0	9	+1.7427772E-01	+1.9474096E-02	+1.9099598E-01	+1.2459999E-01	+1.7972540E-01
235.0	8	+1.5645570E-01	+2.2560246E-02	+2.4099599E-01	+1.7099994E-01	+1.7967396E-01
246.0	9	+1.7186676E-01	+1.4487326E-02	+2.0079594E-01	+1.5659999E-01	+1.7961734E-01
254.0	9	+1.8225579E-01	+1.0254205E-02	+1.9849597E-01	+1.67999998E-01	+1.7957621E-01
259.0	8	+1.7226231E-01	+2.3991595E-02	+1.9299595E-01	+1.1909997E-01	+1.7955046E-01
265.0	1	+1.7365997E-01	+0.0000000E+07	+1.7369597E-01	+1.7369997E-01	+1.7951959E-01
266.0	8	+1.8399977E-01	+9.5459702E-03	+1.9799595E-01	+1.7239999E-01	+1.7951446E-01

STAGE 1. DISCTEC MOTOR=0012029. BIAXIAL CH5=.002 IN/MIN. STRAIN MAX STRS.

```

N = 6.4306406E-01 Y = 1.1 + 2.0302134E+01
R = +1.0417305E-01 SIGNIFICANCE OF FTEST DOM = 59
I = +8.019175E-01 SIGNIFICANCE OF FTEST DOM = 59
G = +3.019175E-01 SIGNIFICANCE OF FTEST DOM = 59
F = +6.4306406E-01 SIGNIFICANCE OF FTEST DOM = 59
STORAGE CONDITIONS = HMB 11 MM/RH
DECIMALS OF FTEST DOM = 100
TEST CONDITIONS = 100 DFC F.

```

PARARMETER = MAXIMUM STRESS  
UNIT OF MEASURE = PSI  
5 15.00 24.00 32.00 40.00 48.00

STAGE 1. DISCTED MOTOR=0912029.F1AX1A1. CH5=.092 IN/MIN MAX STRS

Figure 42

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	8	+2.3512490E+01	+5.783296E+00	+3.1000000E+01	+1.8599990E+01	+2.5673049E+01
225.0	9	+2.9592202E+01	+4.0137769E+00	+3.6789553E+01	+2.5389999E+01	+2.5975631E+01
235.0	8	+2.7637481E+01	+2.3001932E+00	+3.0295587E+01	+2.3899993E+01	+2.6227798E+01
246.0	9	+2.0463317E+01	+1.5734271E+00	+2.2989590E+01	+1.8069992E+01	+2.6505157E+01
254.0	9	+2.6756646E+01	+2.0300556E+00	+3.0335596E+01	+2.2299987E+01	+2.6706878E+01
259.0	8	+2.6655581E+01	+1.4556369E+00	+2.8299587E+01	+2.4199996E+01	+2.6832962E+01
265.0	1	+2.7019589E+01	+3.0000000E+07	+2.7019989E+01	+2.7019989E+01	+2.6984252E+01
266.0	8	+2.56662299E+01	+7.2425086E-01	+3.0619955E+01	+2.8799987E+01	+2.7007460E+01

STAGE 1, DISCTEC MCTOR=0012029, EIA XIAL CHS=.0002 IN/MIN, MAX STRS.

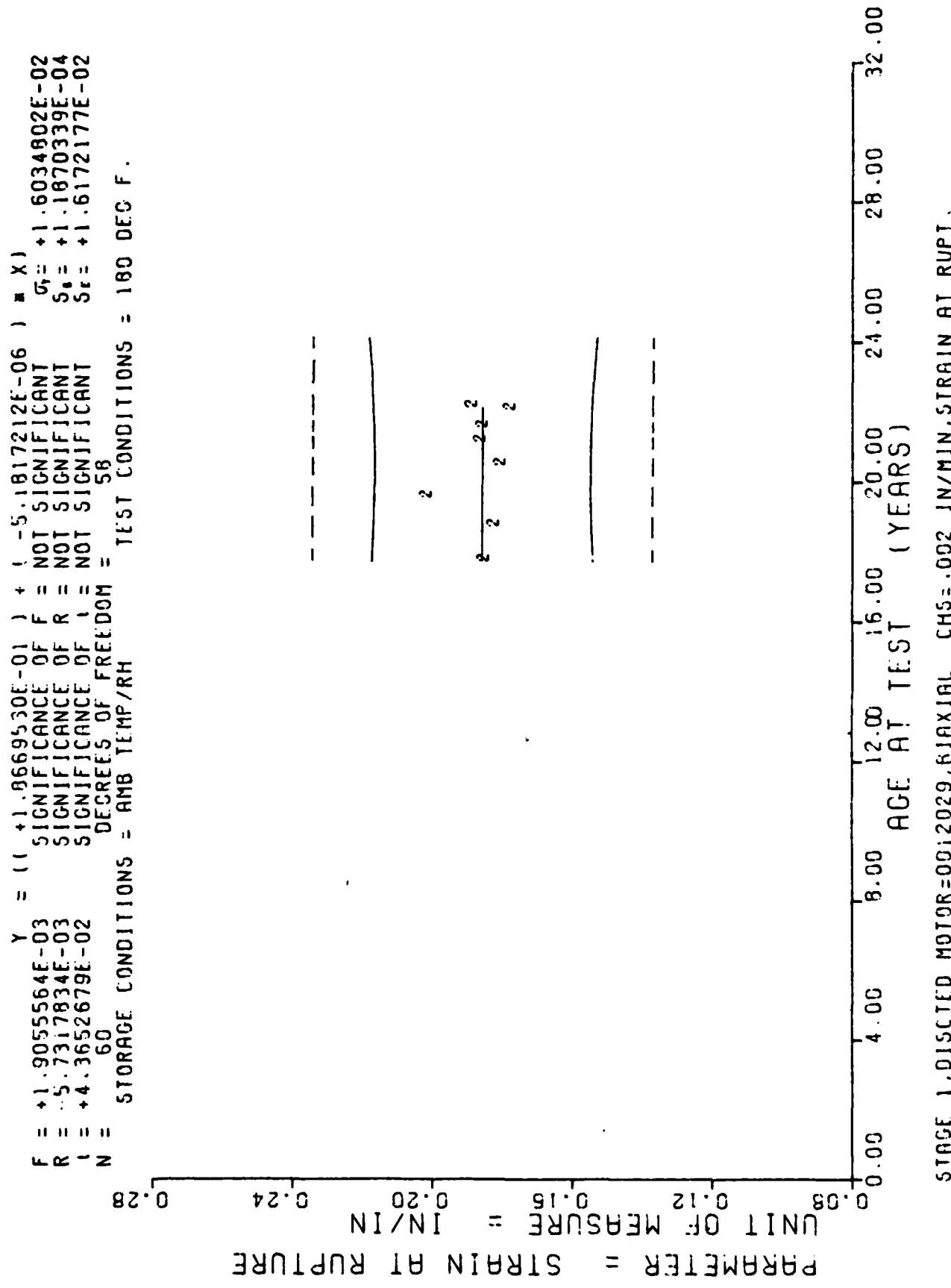


Figure 43

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION Y	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	8	+1.8387484E-01	+1.7391153E-02	+2.1199595E-01	+1.5609994E-01	+1.8559157E-01
225.0	9	+1.8052860E-01	+2.0483115E-02	+1.9899594E-01	+1.2859994E-01	+1.8552941E-01
235.0	8	+2.0015572E-01	+2.1640156E-02	+2.4195598E-01	+1.7259997E-01	+1.8547755E-01
246.0	9	+1.7915534E-01	+1.4159035E-02	+2.0759599E-01	+1.6289997E-01	+1.8542057E-01
254.0	9	+1.8492186E-01	+9.7928230E-03	+2.0039559E-01	+1.7199999E-01	+1.8537914E-01
259.0	8	+1.8424975E-01	+1.1439349E-02	+1.9599597E-01	+1.6599994E-01	+1.8535321E-01
265.0	1	+1.7625558E-01	+0.0300000E+07	+1.7629598E-01	+1.7629998E-01	+1.8532210E-01
266.0	8	+1.8721234E-01	+1.0113811E-02	+2.0199557E-01	+1.7479997E-01	+1.8531692E-01

STAGE 1, DISCTED MCTOR=0012029, E1AXIAL CHS=.002 IN/MIN. STRAIN AT RUPT.

STORAGE CONDITIONS = AMB TEMP/RH      TEST CONDITIONS = 180 DEG F.

## PARAMETER = STRESS AT RUTURE

UNIT OF MEASURE = PSI

1. DISCLOSURE = 00012029. B1 A1 CHS:0002 IN/MIN-SIRES: B1 RUP1

Figure 44

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	8	+2.3071484E+01	+5.4772855E+00	+3.0199590E+01	+1.8099990E+01	+2.4780260E+01
225.0	9	+2.9226638E+01	+4.2554981E+00	+3.6099590E+01	+2.2569992E+01	+2.5316650E+01
235.0	8	+2.7212493E+01	+2.219417E+00	+2.9899593E+01	+2.3500000E+01	+2.5756134E+01
246.0	9	+2.0038879E+01	+1.5929571E+00	+2.2399993E+01	+1.7399993E+01	+2.6239562E+01
254.0	9	+2.6522315E+01	+2.5758820E+00	+3.0109585E+01	+2.2239990E+01	+2.6591156E+01
259.0	8	+2.7624984E+01	+4.2787018E+00	+3.7699596E+01	+2.4000000E+01	+2.6810897E+01
265.0	1	+2.6750000E+01	+0.0010000E+07	+2.6750000E+01	+2.6750000E+01	+2.7074600E+01
266.0	8	+2.9253738E+01	+7.2719175E-01	+3.0109585E+01	+2.8199996E+01	+2.7118545E+01

STAGE 1, DISCTED PCTON=00112029, EIAZIAL CHS=.002 IN/MIN, STRESS AT RUPT.

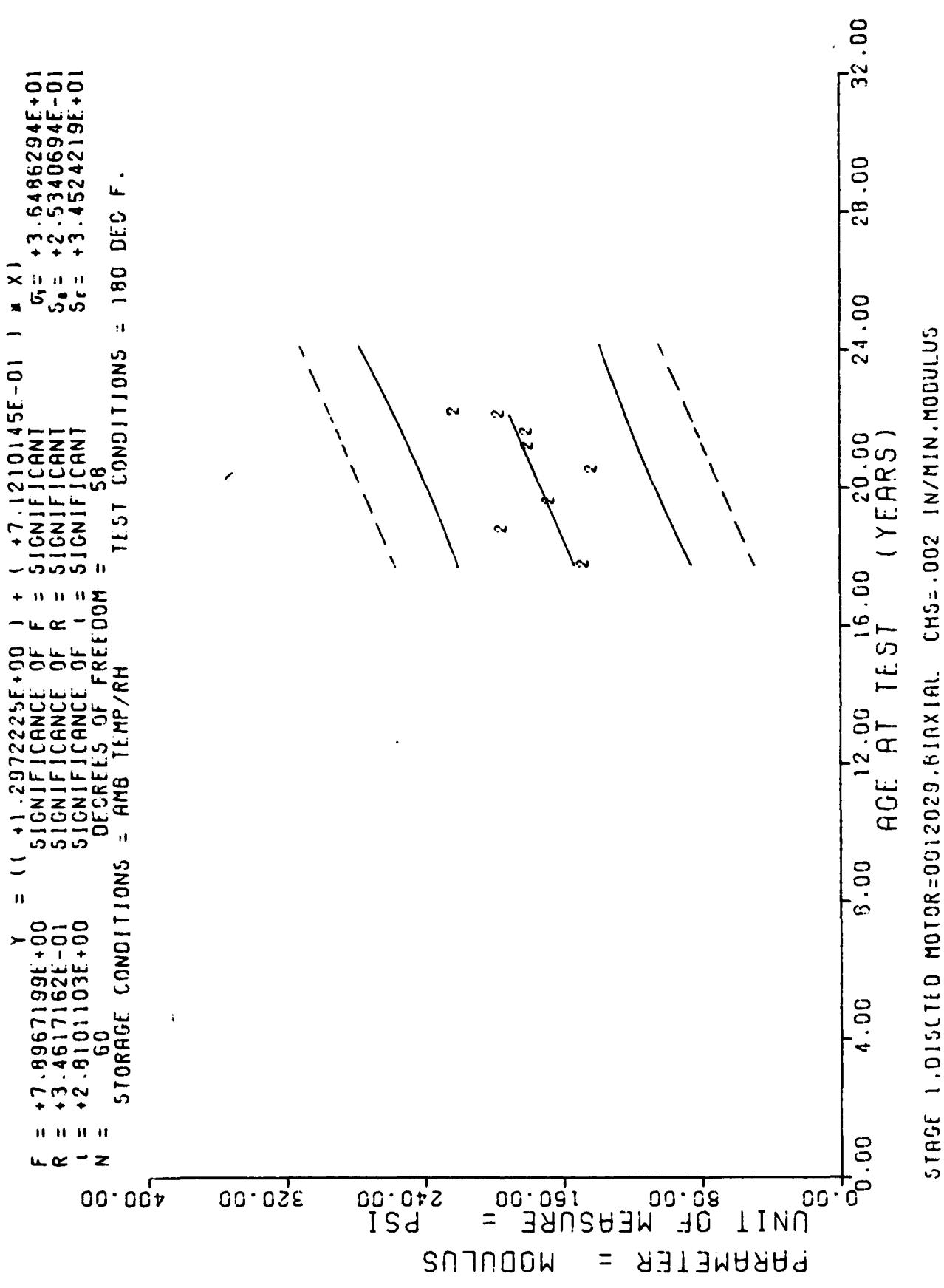


Figure 45

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	8	+1.4E37500E+02	+3.2784741E+01	+2.04040000E+02	+1.2000000E+02	+1.5297482E+02
225.0	9	+1.926665E+02	+3.1960913E+01	+2.7400000E+02	+1.6400000E+02	+1.6152005E+02
235.0	8	+1.6525000E+02	+2.5488092E+01	+1.9900000E+02	+1.3400000E+02	+1.6864105E+02
246.0	9	+1.4044444E+02	+1.5359178E+01	+1.7600000E+02	+1.2200000E+02	+1.7647416E+02
254.0	9	+1.7732332E+02	+2.0615228E+01	+2.0000000E+02	+1.3600000E+02	+1.8217099E+02
259.0	8	+1.7812500E+02	+1.6409383E+01	+2.1100000E+02	+1.6000000E+02	+1.8573149E+02
265.0	1	+1.9460000E+02	+0.000000E+07	+1.9400000E+02	+1.9400000E+02	+1.9000410E+02
266.0	8	+2.1575000E+02	+4.1753528E+01	+2.8700000E+02	+1.8400000E+02	+1.9071620E+02

STAGE 1. DISCTED MC1CR=0012029. BIAXIAL CHS=.002 LR/MIN. MODULUS

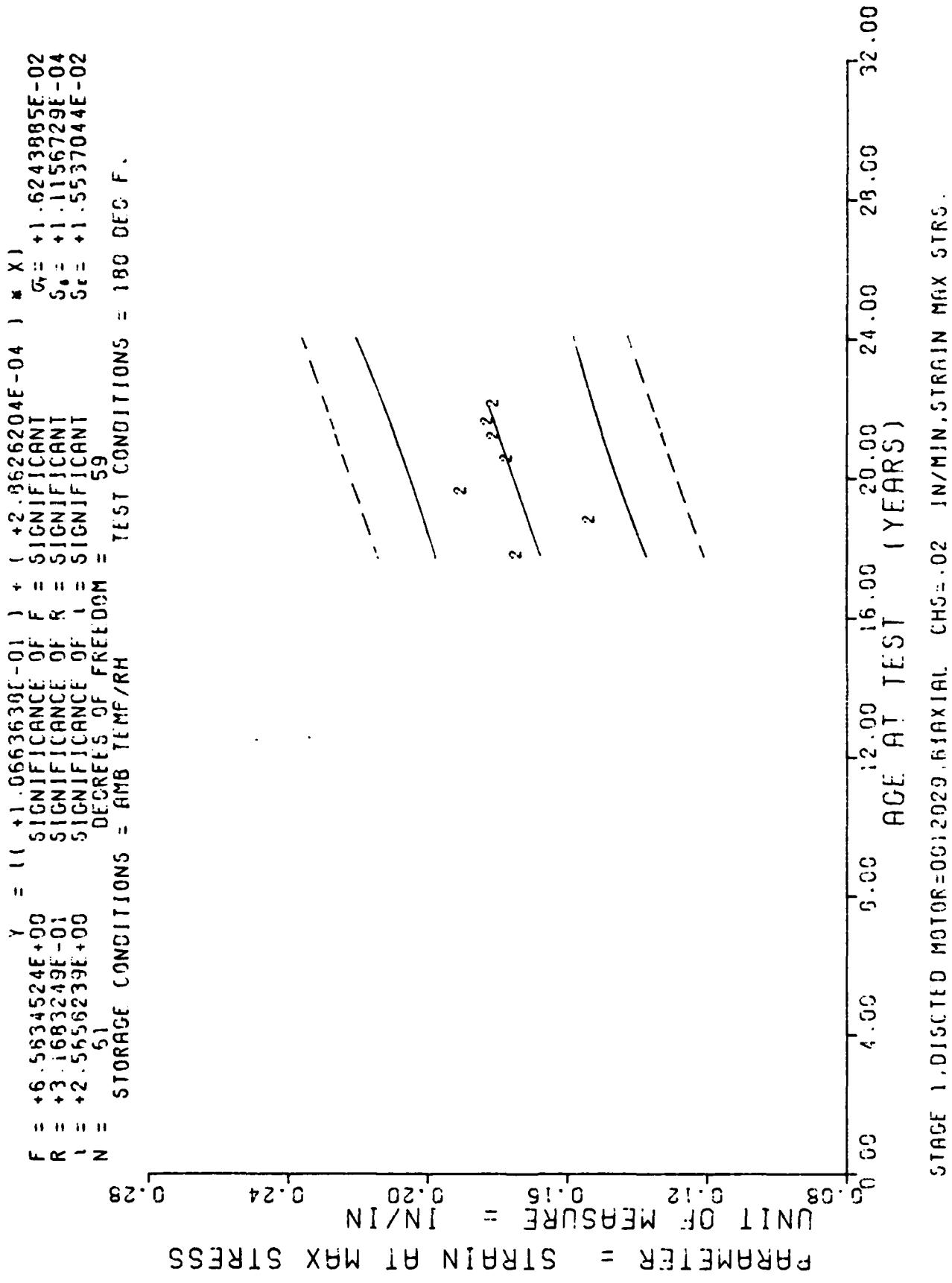


Figure 46

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIAITION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+1.7333304E-01	+1.2138170E-02	+1.8899395E-01	+1.4699995E-01	+1.6761016E-01
225.0	9	+1.5245538E-01	+8.0593527E-03	+1.7089598E-01	+1.4489996E-01	+1.7104530E-01
235.0	9	+1.8905870E-01	+2.1004765E-02	+2.1299599E-01	+1.5799999E-01	+1.7390793E-01
246.0	8	+1.7556724E-01	+1.3760742E-02	+1.9699596E-01	+1.5749996E-01	+1.7705678E-01
254.0	7	+1.7571402E-01	+1.1055135E-02	+1.9279998E-01	+1.5889996E-01	+1.7934691E-01
259.0	10	+1.8159567E-01	+1.0127923E-02	+2.0099997E-01	+1.6899996E-01	+1.8077820E-01
265.0	9	+1.7693307E-01	+7.7528537E-03	+1.8999999E-01	+1.6529995E-01	+1.8249577E-01

STAGE 1, DISCTED MCTOR=0012029, EIA XIAL CHS=.02 IN/MIN. STRAIN MAX STRS.

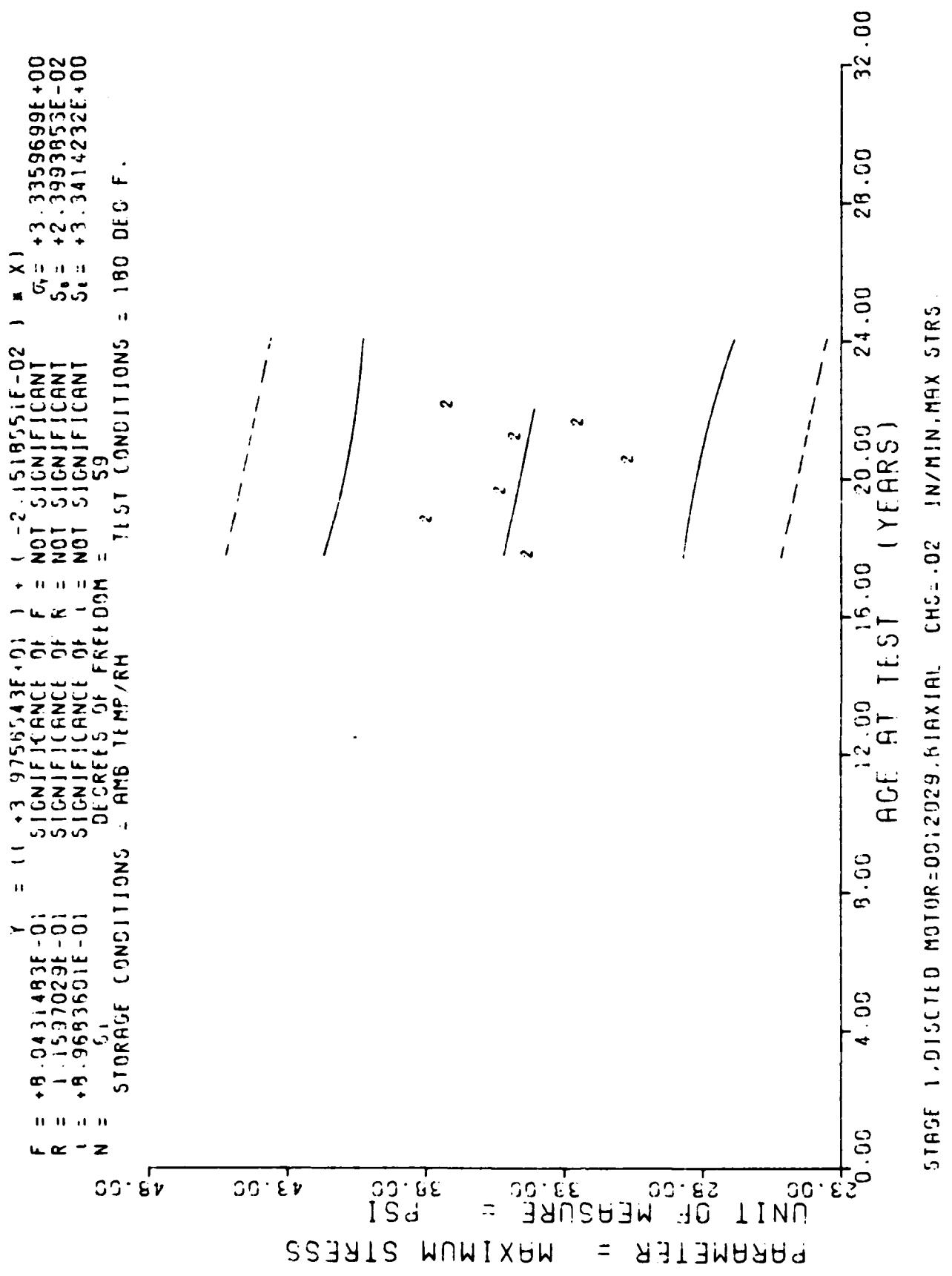


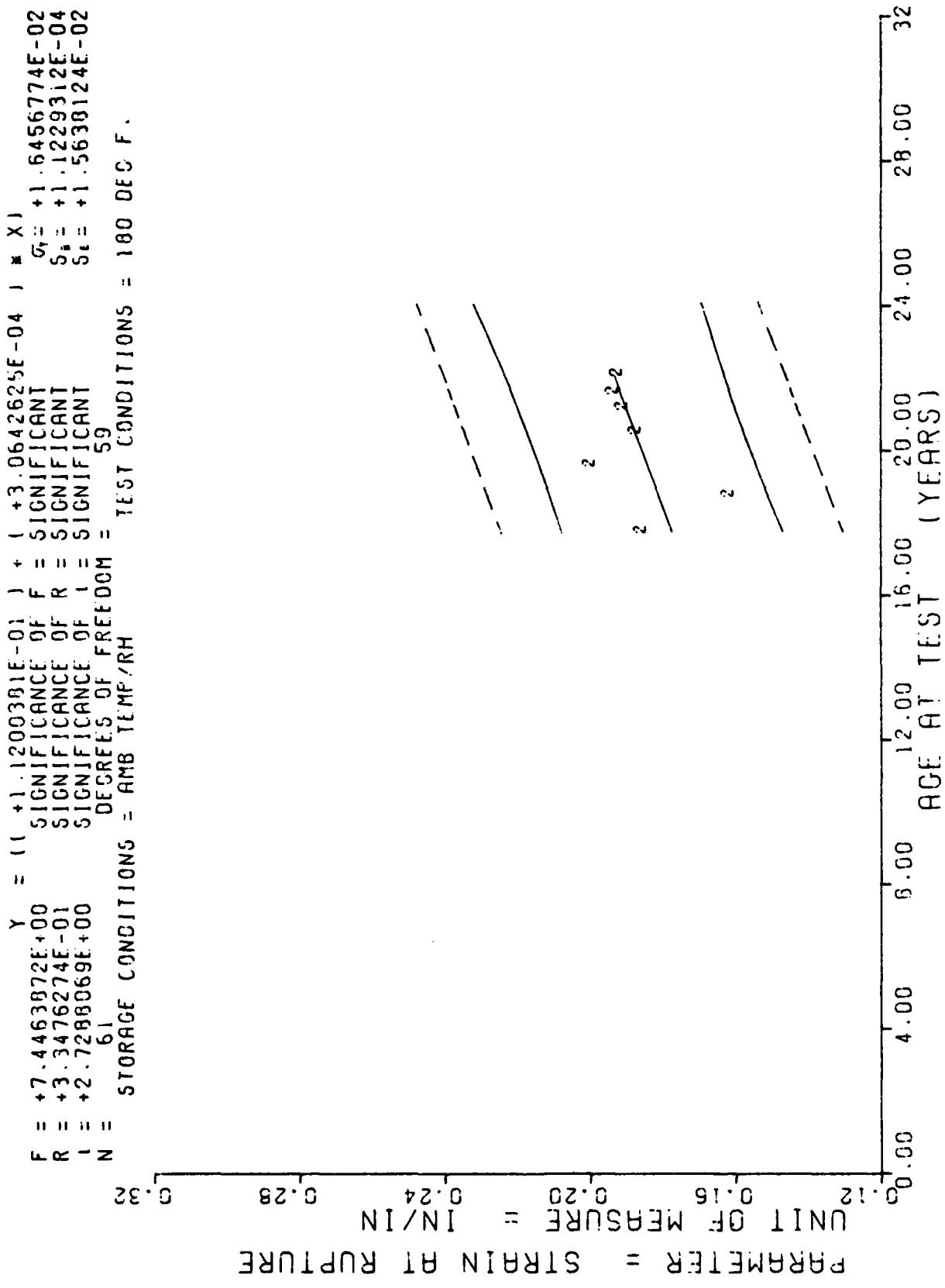
Figure 47

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+3.4155517E+01	+4.4409661E+00	+3.75999690E+01	+2.5399993E+01	+3.5175079E+01
225.0	9	+3.7811050E+01	+1.5388230E+00	+4.2369595E+01	+3.5939987E+01	+3.4916854E+01
235.0	9	+3.5147720E+01	+1.1451754E+00	+3.8519589E+01	+3.2500000E+01	+3.4701675E+01
246.0	8	+3.0527481E+01	+2.0561628E+00	+3.3699596E+01	+2.7679992E+01	+3.4464965E+01
254.0	7	+3.4604278E+01	+2.8271237E+00	+3.8789993E+01	+3.1569992E+01	+3.4292831E+01
259.0	10	+3.2335581E+01	+1.8344079E+00	+3.5199996E+01	+2.9000000E+01	+3.4185226E+01
265.0	9	+3.7043258E+01	+1.2249066E+00	+3.8989590E+01	+3.5519989E+01	+3.4056121E+01

STAGE 1. DISCTED MCTOR=0012029. BIAXIAL CHS=.02 IN/MIN.MAX STRS.



STAGE 1, DISC'D MOTOR=0012029, RIAZIAL CHSS=.02 IN/MIN, STRAIN AT RUPT.

Figure 48

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+1.8466639E-01	+6.4285038E-03	+1.9399594E-01	+1.7499995E-01	+1.7727255E-01
225.0	9	+1.6061091E-01	+1.0281990E-02	+1.8489598E-01	+1.5179997E-01	+1.8094968E-01
235.0	9	+1.9567737E-01	+2.197477E-02	+2.1999996E-01	+1.6799998E-01	+1.8401396E-01
246.0	8	+1.8617475E-01	+1.02229079E-02	+2.0199996E-01	+1.6959995E-01	+1.8738466E-01
254.0	7	+1.8575584E-01	+1.3125375E-02	+2.0189994E-01	+1.6229999E-01	+1.8983608E-01
259.0	10	+1.9239574E-01	+1.0343657E-02	+2.01599996E-01	+1.7899996E-01	+1.9136816E-01
265.0	9	+1.9134414E-01	+6.5621119E-03	+2.0109599E-01	+1.8209959E-01	+1.9320672E-01

STAGE 1,DISCTEC MCTQR=0012029, EIAAXIAL CHS=.02 IN/MIN. STRAIN AT RUPT.

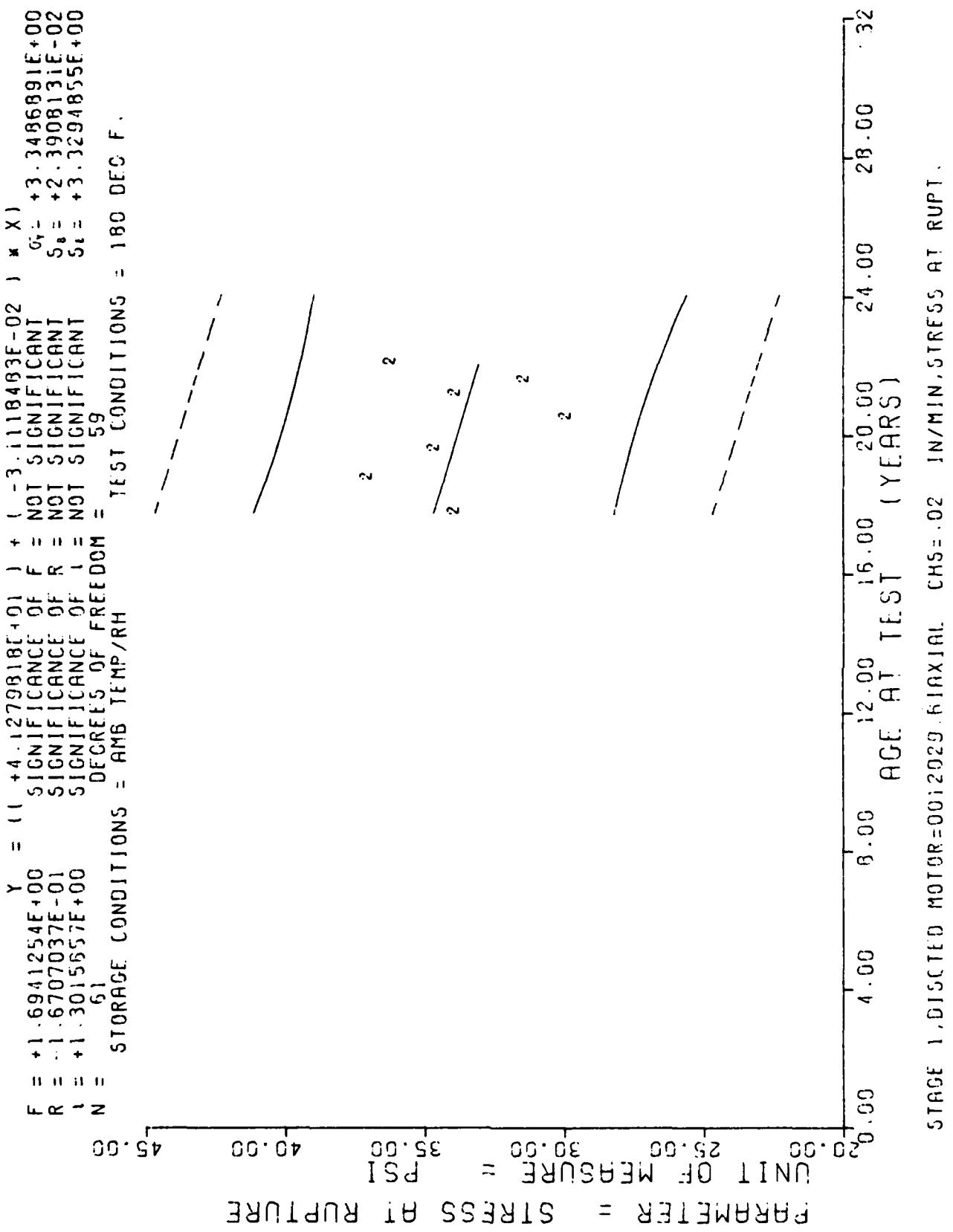


Figure 49

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

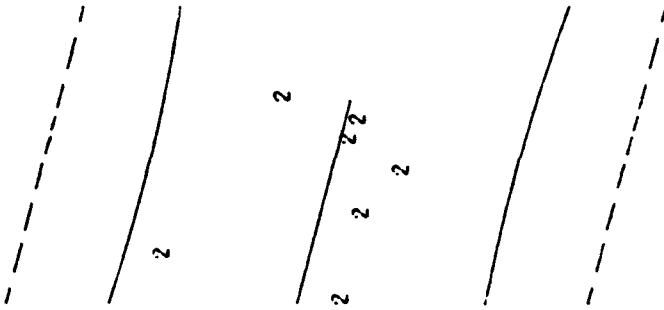
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+3.3766616E+01	+4.6004558E+00	+3.83998593E+01	+2.4799987E+01	+3.46651580E+01
225.0	9	+3.6902175E+01	+2.0865903E+00	+4.1699996E+01	+3.4269989E+01	+3.4278152E+01
235.0	9	+3.4456627E+01	+1.5993657E+00	+3.8000000E+01	+3.2299987E+01	+3.3966964E+01
246.0	6	+2.9776229E+01	+2.1290267E+00	+3.2899993E+01	+2.6599990E+01	+3.3624664E+01
254.0	7	+3.3737136E+01	+2.6739765E+00	+3.8000000E+01	+3.0989990E+01	+3.375717E+01
259.0	10	+3.1275668E+01	+1.6820266E+00	+3.4299587E+01	+2.8199996E+01	+3.3220123E+01
265.0	9	+3.6055567E+01	+1.2213937E+00	+3.7789553E+01	+3.44099988E+01	+3.3033416E+01

STAGE 1. DISCTED MCTOR=0012029. BIAXIAL CHS=.02 IN/MIN. STRESS AT RUPT.

$F = +2.19633088E+00$        $Y = 11 + 3.6397504E+02$        $1 = (-4.3969467E-01) * X_1$   
 $R = -1.6944665E-01$       SIGNIFICANCE OF  $F$  = NOT SIGNIFICANT       $G_1 = +4.1716743E+01$   
 $1 = +1.4820050E+00$       SIGNIFICANCE OF  $R$  = NOT SIGNIFICANT       $S_0 = +2.9662833E-01$   
 $N = 61$       DEGREES OF FREEDOM = 59      SIGNIFICANCE OF  $1$  = NOT SIGNIFICANT       $S_{t1} = +4.1306946E+01$   
STORAGE CONDITIONS = AMB TEMP/RH      TEST CONDITIONS = 180 DEG F.

UNIT OF MEASURE = PSI  
150.00      240.00      320.00      400.00      480.00

PARAMETER = MODULUS



STAGE 1, DISCITED MOTOR=0012029, RAXIAL CHS=.02 IN/MIN, MODULUS

Figure 50

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+2.490000E+02	+3.8356676E+01	+3.150000E+02	+1.850000E+02	+2.7033911E+02
225.0	9	+3.250000E+02	+3.0074906E+01	+3.830000E+02	+2.750000E+02	+2.6506396E+02
235.0	9	+2.4011109E+02	+3.7176754E+01	+2.980000E+02	+1.970000E+02	+2.6066772E+02
246.0	8	+2.2287500E+02	+2.2408145E+01	+2.690000E+02	+2.020000E+02	+2.5583229E+02
254.0	7	+2.4557142E+02	+2.2824381E+01	+2.810000E+02	+2.210000E+02	+2.5231544E+02
259.0	10	+2.4159999E+02	+1.8488434E+01	+2.790000E+02	+2.180000E+02	+2.5011743E+02
265.0	9	+2.7344433E+02	+2.46663288E+01	+3.070000E+02	+2.380000E+02	+2.4747979E+02

STAGE 1, DISCTED MOTOR=0012029, EIA XIAL CHS=.002 IN/MIN. MODULUS

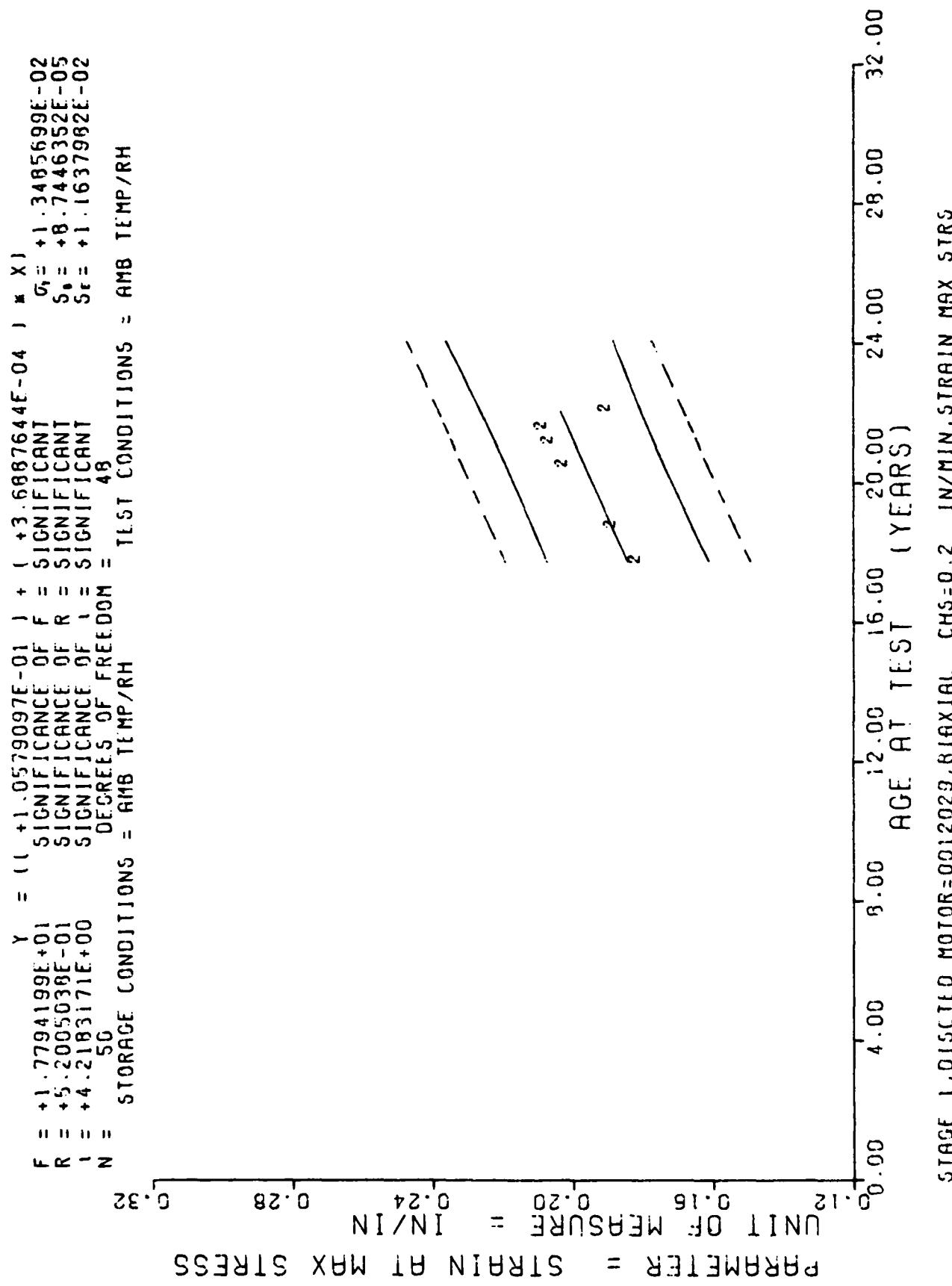


Figure 51

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.6	9	+1.912315E-01	+7.9633212E-03	+1.9439595E-01	+1.6939997E-01	+1.8436163E-01
225.0	9	+1.8807744E-01	+1.2728039E-02	+2.1519594E-01	+1.7089998E-01	+1.8878811E-01
246.0	9	+2.0187759E-01	+5.6006523E-03	+2.0909594E-01	+1.9349998E-01	+1.9653457E-01
254.0	8	+2.0606219E-01	+9.1417013E-03	+2.1699554E-01	+1.9299995E-01	+1.9948554E-01
259.0	7	+2.0785683E-01	+1.2619358E-02	+2.2399597E-01	+1.8999999E-01	+2.0132994E-01
265.0	8	+1.8567485E-01	+7.2759005E-03	+1.9699596E-01	+1.7429995E-01	+2.0354318E-01

STAGE 1, DISCTED MCTOR=0012029, E1AXIAL CHS=0.2 IN/MIN. STRAIN MAX STRS.

$F = +3.6433043E+01$        $Y = (1 + 6.8929675E+01) + (1 + 1.4422211E-01) \times X$   
 $R = +6.6682979E-01$       SIGNIFICANCE OF  $F = \text{SIGNIFICANT}$   
 $1 = +6.1995035E+00$       SIGNIFICANCE OF  $R = \text{SIGNIFICANT}$   
 $N = 50$       SIGNIFICANCE OF  $1 = \text{SIGNIFICANT}$   
 $48$       DEGREES OF FREEDOM = 48  
 STORAGE CONDITIONS = AMB TEMP/RH      TEST CONDITIONS = AMB TEMP/RH

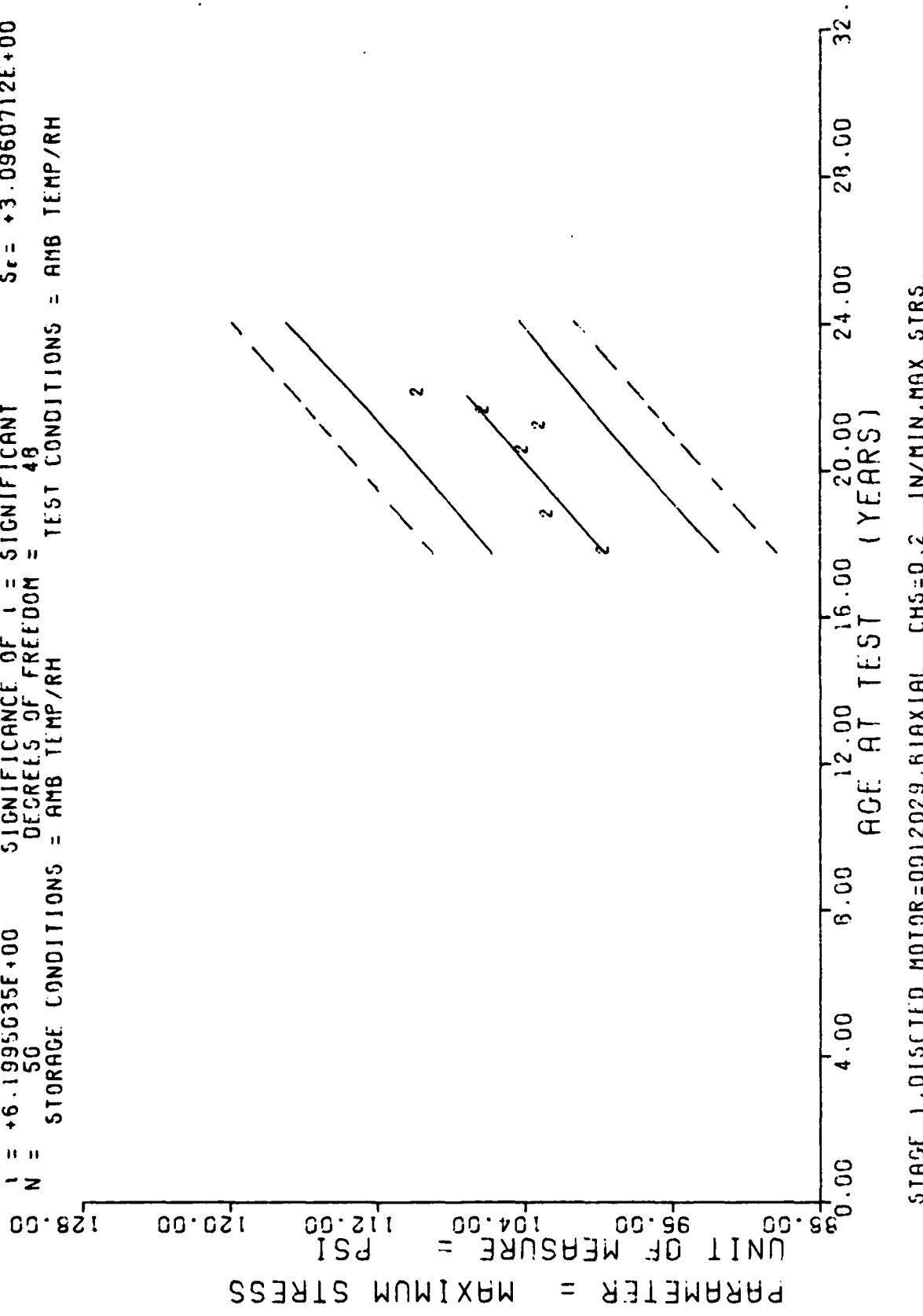


Figure 52

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+9.5466784E+01	+2.6195737E+00	+1.0316599E+02	+9.6309997E+01	+9.9648971E+01
225.0	9	+1.0251768E+02	+1.4357205E+00	+1.6529598E+02	+1.0097999E+02	+1.0137963E+02
246.0	9	+1.0386588E+02	+3.5336691E+00	+1.0848599E+02	+9.8879989E+01	+1.0440830E+02
254.0	8	+1.0293862E+02	+1.5111031E+00	+1.0554598E+02	+1.0028999E+02	+1.0556208E+02
259.0	7	+1.0599992E+02	+5.0307970E+00	+1.1309599E+02	+9.8590000E+01	+1.0628318E+02
265.0	8	+1.052490E+02	+1.7593146E+00	+1.1203599E+02	+1.0779998E+02	+1.0714852E+02

STAGE 1. DISCTED MCTCR=0012029, BIAXIAL CHS=0.2 IN/MIN, MAX STRS.

Y =  $11 + 9.0545563E+00 F = 1.4318885E-01 R = 3.9837164E-01 I = 3.0090789E+00 N = 50$   
 $S = 1.14318884E-02 S_0 = 1.0669131E-04 S_{tr} = 1.4199238E-02$   
 $\alpha = 3.2104256E-04$   
 $\sigma_x = 1.5321884E-02$   
 $\sigma_y = 1.0669131E-04$   
 $\sigma_{tr} = 1.4199238E-02$   
 $\text{TEST CONDITIONS} = \text{AMB TEMP/RH}$   
 $\text{STORAGE CONDITIONS} = \text{AMB TEMP/RH}$

PARAMETER = STRAIN AT Rupture  
UNIT OF MEASURE = IN/IN  
2 0.15 0.20 0.24 0.28 0.32

AGE AT TEST (YEARS)
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00

STAGE 1. DISSECTED MOTOR=00112029.6 AXIAL CHS=0.2 IN/MIN. STRAIN AT RUPT.

Figure 53

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+2.0588850E-01	+8.6978124E-03	+2.2249596E-01	+1.9099998E-01	+2.1157091E-01
225.0	9	+2.01548849E-01	+1.3448483E-02	+2.3769598E-01	+1.9259995E-01	+2.1542340E-01
246.0	9	+2.03514407E-01	+7.3752533E-03	+2.4675594E-01	+2.1999996E-01	+2.2216520E-01
254.0	8	+2.02612471E-01	+9.3326120E-03	+2.3699598E-01	+2.0999997E-01	+2.2473365E-01
259.0	7	+2.03542839E-01	+1.4118943E-02	+2.05599598E-01	+2.0999996E-01	+2.2633896E-01
265.0	8	+2.01163725E-01	+1.0636552E-02	+2.02699999E-01	+1.9629997E-01	+2.2826510E-01

STAGE 1. DISCTED MCTOR=0012029, E1AXIAL CHS=0.2 IN/MIN. STRAIN AT RUPT.

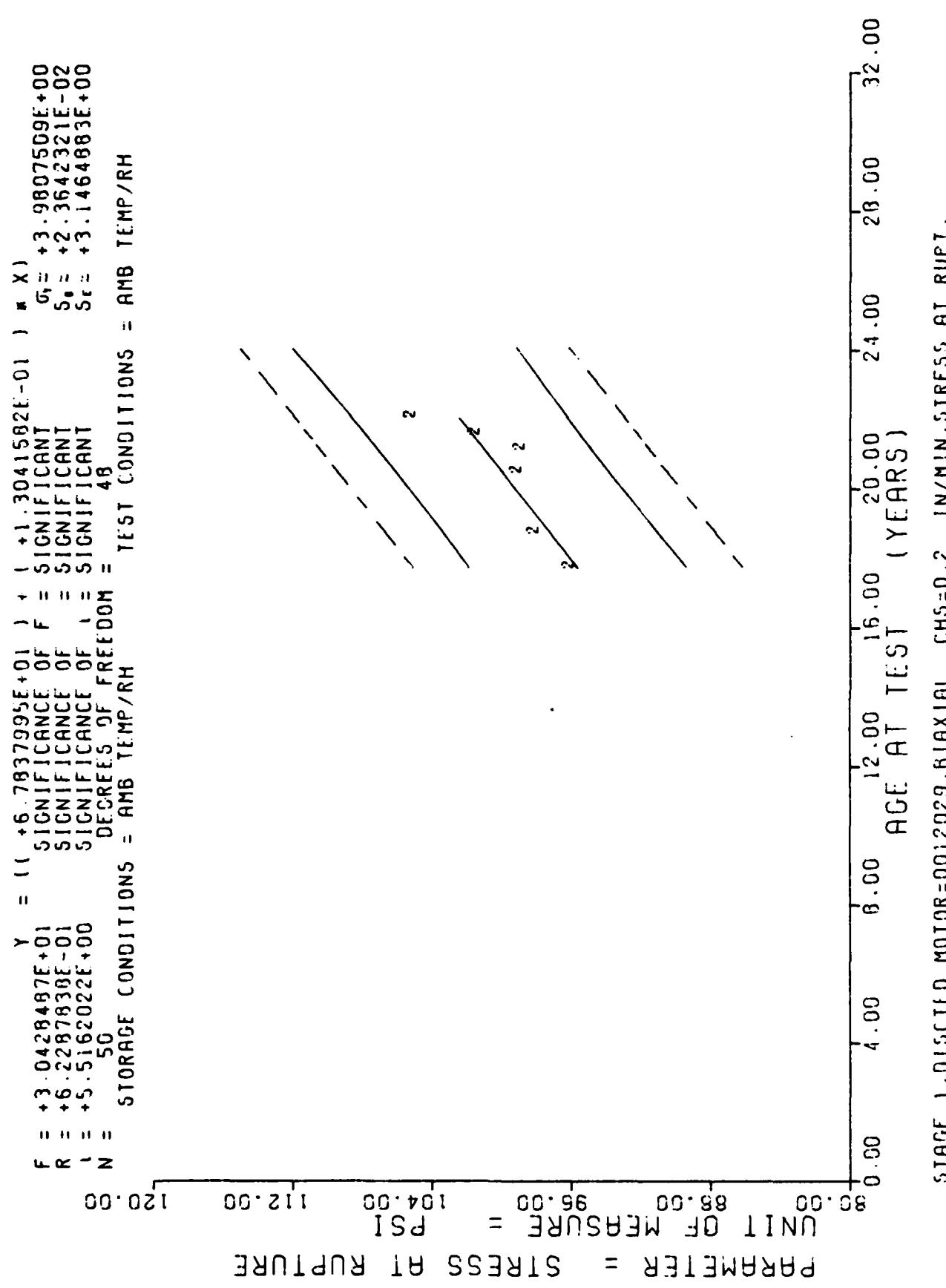


Figure 54

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
						+9.5616561E+01
213.0	9	+9.5E74374E+01	+2.1119012E+00	+9.5769589E+01	+9.3399993E+01	+9.7181549E+01
225.0	9	+9.7923217E+01	+1.9840577E+00	+1.0103599E+02	+9.4809997E+01	+9.9920288E+01
246.0	9	+5.8505456E+01	+3.2631652E+00	+1.0319595E+02	+9.4399993E+01	+9.9920288E+01
254.0	8	+5.8693664E+01	+1.7747080E+00	+1.0139999E+02	+9.5299987E+01	+1.0096360E+02
259.0	7	+1.0127133E+02	+5.3374145E+00	+1.0839599E+02	+9.2799987E+01	+1.0161569E+02
265.0	8	+1.049E617E+02	+1.6759248E+00	+1.0779598E+02	+1.0319999E+02	+1.0239817E+02

STAGE 1,DISCTEC MCTOR=0012029,EIAXIAL CHS=0.2 IN/MIN-STRESS AT RUPT.

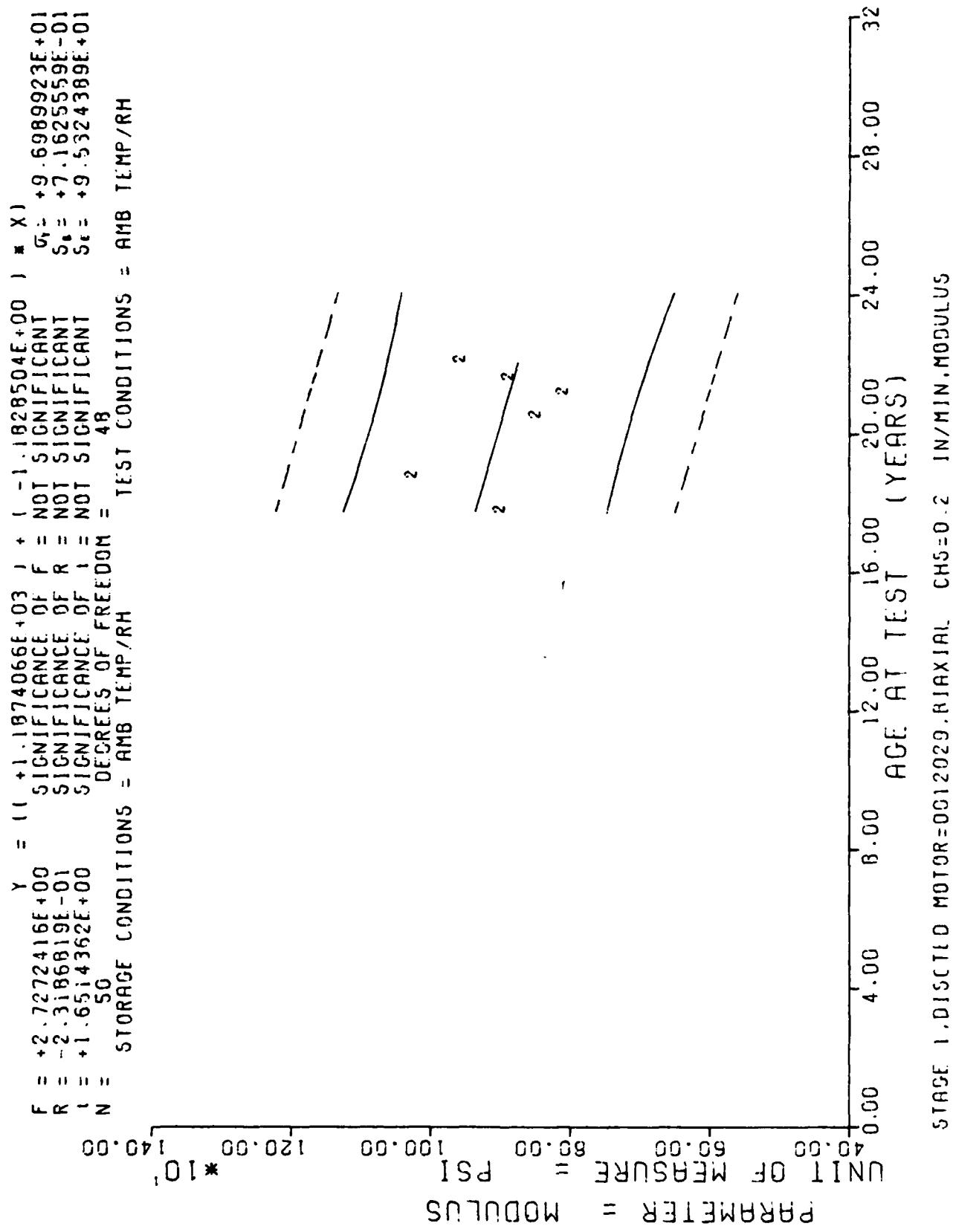


Figure 55

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+2.538E67E+02	+5.2353234E+01	+9.900000E+02	+8.320000E+02	+9.35469222E+02
	9	+1.020E886E+03	+1.0725838E+02	+1.1340000E+03	+8.660000E+02	+9.2126513E+02
225.0	9	+8.426E867E+02	+5.5415862E+01	+9.1890000E+02	+7.4030000E+02	+8.9642529E+02
240.0	9	+8.0400000E+02	+6.2541414E+01	+9.0400000E+02	+7.3500000E+02	+8.8696240E+02
254.0	8	+8.8214282E+02	+6.5496831E+01	+9.9700000E+02	+7.9400000E+02	+8.9104809E+02
259.0	7	+9.5087500E+02	+3.4207089E+01	+9.9700000E+02	+8.9700000E+02	+8.7395117E+02
265.0	8					

STAGE 1 • DISCTED MATOR=0012029. E1AXIAL CHS=0.2 IN/MIN. MODULUS

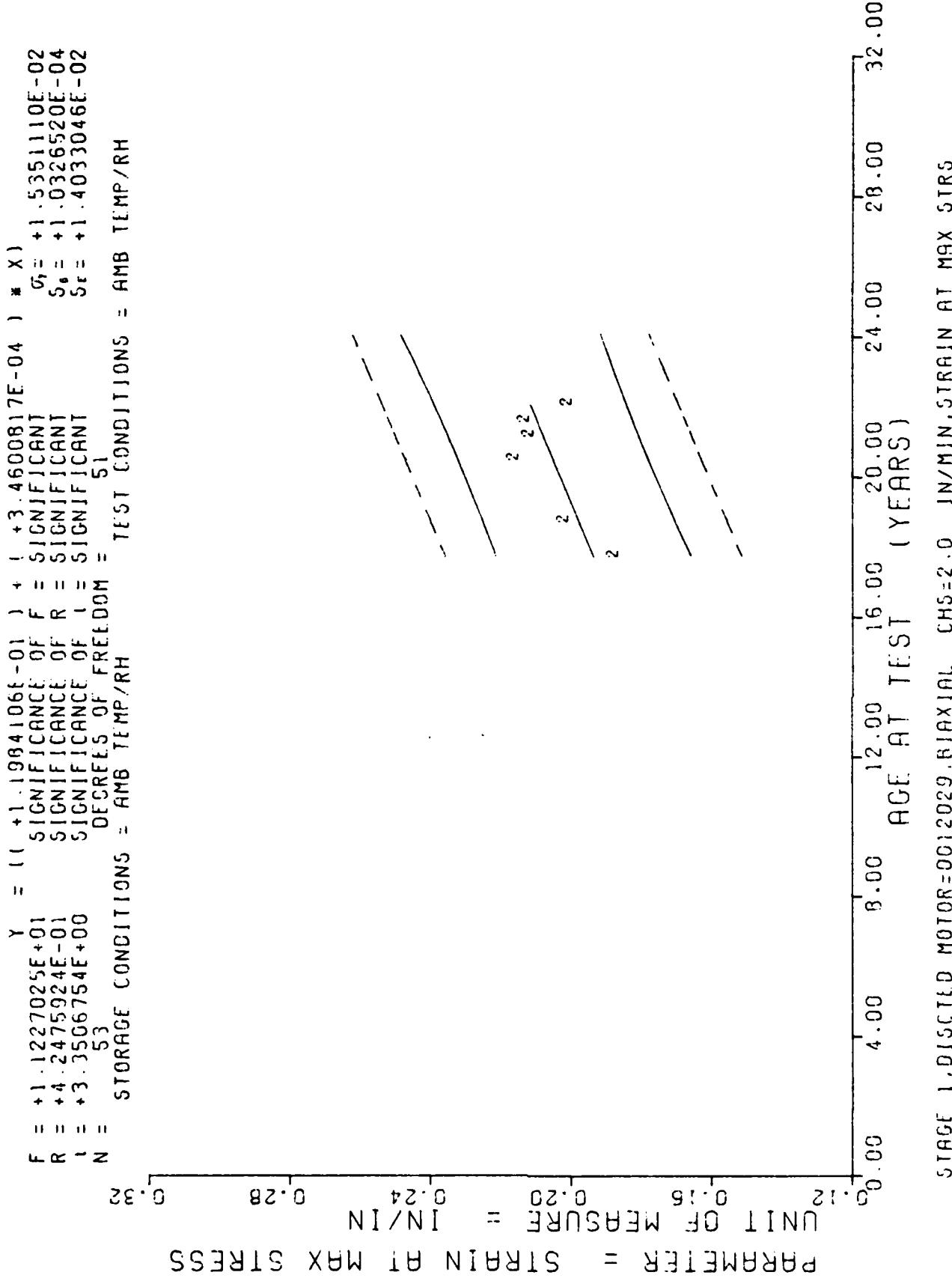


Figure 56

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+1.8672198E-01	+5.4588830E-03	+2.0049595E-01	+1.8199998E-01	+1.9354075E-01
225.0	8	+2.0092475E-01	+2.1535587E-02	+2.4729596E-01	+1.7639994E-01	+1.9769287E-01
246.0	9	+2.1502164E-01	+7.7239425E-03	+2.2409559E-01	+2.0369994E-01	+2.0495903E-01
254.0	9	+2.1074432E-01	+1.0644858E-02	+2.3299598E-01	+1.9599997E-01	+2.0772713E-01
259.0	9	+2.1155577E-01	+1.5947555E-02	+2.3499555E-01	+1.9099998E-01	+2.0945715E-01
265.0	9	+1.9985532E-01	+6.7314858E-03	+2.0999597E-01	+1.9089996E-01	+2.1153318E-01

STAGE 1, DISCTED MCTCR=0012029, EIAXIAL CHS=2.0 IN/MIN. STRAIN AT MAX STRS.

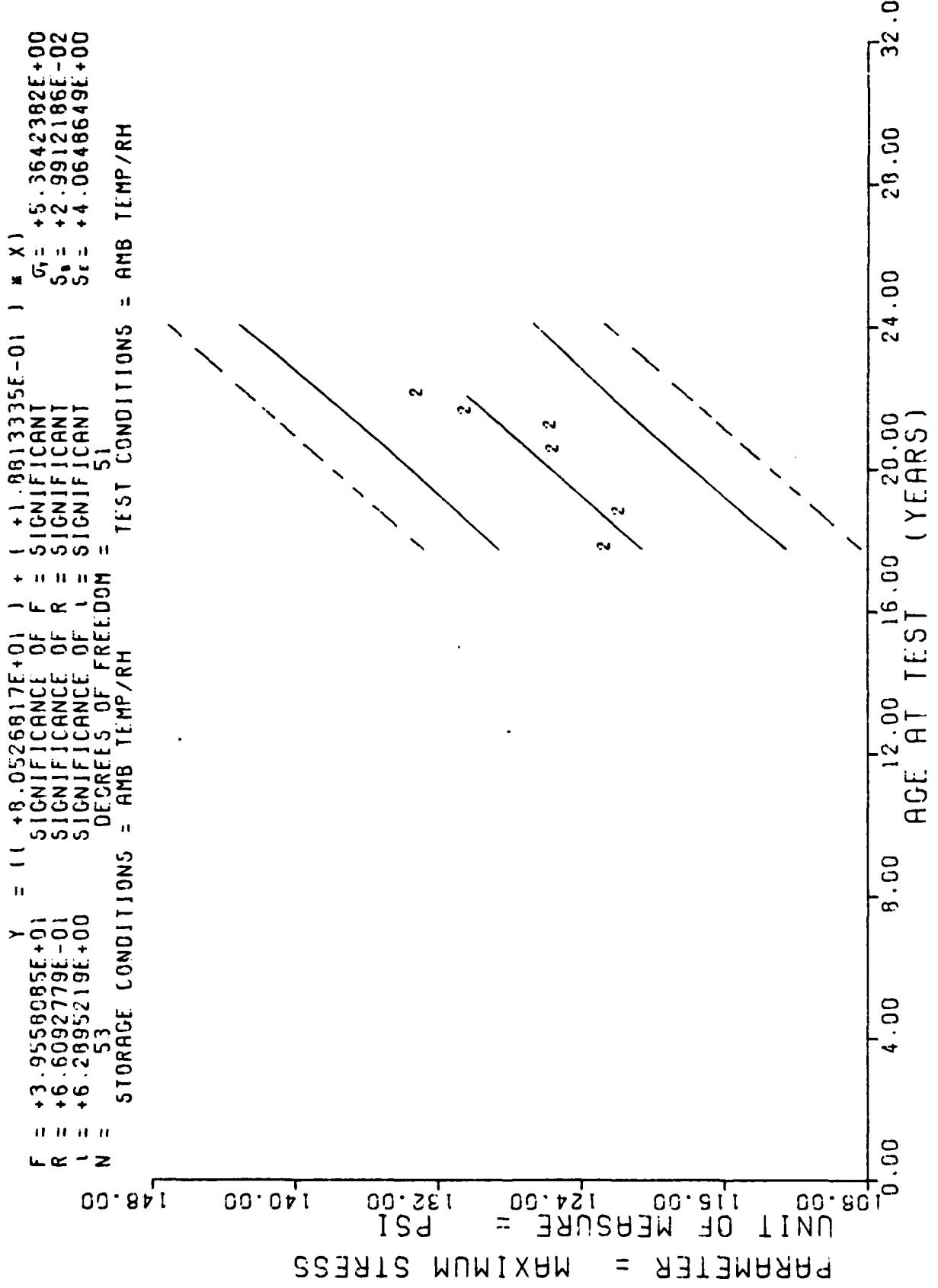


Figure 57

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+1.2244549E+02	+2.1419327E+00	+1.2558659E+02	+1.1850000E+02	+1.2059921E+02
225.0	8	+1.2164492E+02	+2.4829267E+00	+1.2737598E+02	+1.1989999E+02	+1.2285681E+02
246.0	9	+1.2534E78E+02	+3.5832674E+00	+1.3343598E+02	+1.1844959E+02	+1.2680761E+02
246.0	9	+1.2546568E+02	+1.5611572E+00	+1.2944595E+02	+1.2244999E+02	+1.2831268E+02
254.0	9	+1.302326E+02	+6.5498433E+00	+1.3615559E+02	+1.1839999E+02	+1.2925334E+02
259.0	9	+1.3251712E+02	+1.5273966E+00	+1.3646598E+02	+1.3005999E+02	+1.3038215E+02
265.0	9	+1.3251712E+02	+1.5273966E+00	+1.3646598E+02	+1.3005999E+02	+1.3038215E+02

STAGE 1, CIRCLED MC1CR=0012029, EIA XIAL CHS=2.0 IN/MIN. MAX STRS.

$F = +1.187465iE+00$        $Y = (1 + 2.16745i4E-01) + (1 + 1.45i7956i-04) * X$   
 $R = +1.5084375E-01$       SIGNIFICANCE OF  $F$  = NOT SIGNIFICANT       $\sigma_r = +1.8137375E-02$   
 $t = +1.0697087E+00$       SIGNIFICANCE OF  $R$  = NOT SIGNIFICANT       $S_r = +1.3322786E-04$   
 $N = 53$       DEGREES OF FREEDOM = 51      SIGNIFICANCE OF  $t$  = NOT SIGNIFICANT       $S_t = +1.0104769E-02$   
 STORAGE CONDITIONS = AMB TEMP/RH      TEST CONDITIONS = AMB TEMP/RH

UNIT OF MEASURE = IN/IN  
 PARAMETER = STRAIN AT RUPTURE  
 0.00      0.20      0.24      0.28      0.32      0.36

0.00      4.00      8.00      12.00      16.00      20.00      24.00      28.00      32.00  
 AGE AT TEST (YEARS)

STAGE 1, DISC'D MOTOR=0012029, RIAZIAL, CH5=2.0 IN/MIN, STRAIN AT RUPT.

Figure 58

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

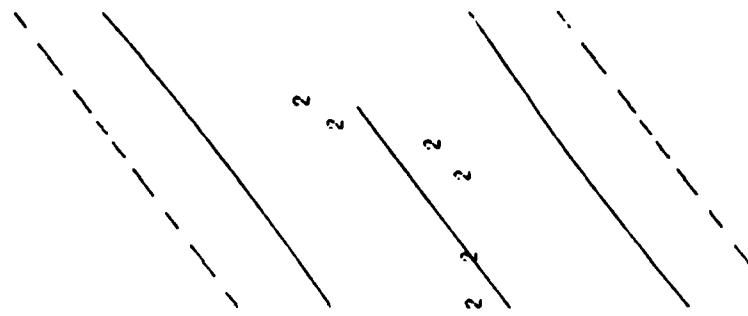
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+2.4324409E-01	+9.1637536E-03	+2.5369995E-01	+2.2799998E-01	+2.4766838E-01
225.0	6	+2.4252474E-01	+1.5606089E-02	+2.7399598E-01	+2.0899999E-01	+2.4941051E-01
246.0	9	+2.7681054E-01	+1.3660394E-02	+2.9899596E-01	+2.5699996E-01	+2.5245928E-01
254.0	9	+2.5377738E-01	+9.3877122E-03	+2.6899599E-01	+2.4299997E-01	+2.5362074E-01
259.0	9	+2.50688670E-01	+1.5574830E-02	+2.6799594E-01	+2.0399999E-01	+2.5434660E-01
265.0	9	+2.4411070E-01	+1.1089263E-02	+2.6509594E-01	+2.2859996E-01	+2.5521767E-01

STAGE 1, DISCTED MATOR=0012029, EIAXIAL CHS=2.0 IN/MIN. STRAIN AT RUPY.

$F = +1.9309534E+01$     $Y = (1 + 8.0655065E+01) + (1 + 1.5617947E-01) * X_1$   
 $R = +5.2484328E-01$    SIGNIFICANCE OF  $F = \text{SIGNIFICANT}$     $\sigma_1 = +5.6077751E+00$   
 $1 = +4.4033549E+00$    SIGNIFICANCE OF  $R = \text{SIGNIFICANT}$     $S_1 = +3.5466291E-02$   
 $N = 53$    DEGREES OF FREEDOM = 51    $S_F = +4.8199020E+00$   
 STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = AMB TEMP/RH

UNIT OF MEASURE = PSI   PARAMETER = STRESS AT RUPTURE  
 0.00   109.00   119.00   129.00   139.00   149.00

PARAMETER = STRESS AT RUPTURE



STAGE 1, DISC1.D MOTR=0012029, R1AXIAL CH5=2.0 IN/MIN, STRESS AT RUPT.

Figure 59

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	J	9 +1.154E+21E+02	+2.1183411E+00	+1.1775598E+02	+1.1129998E+02	+1.1392209E+02
225.0	S	8 +1.1571115E+02	+4.4047222E+00	+1.2559599E+02	+1.1129958E+02	+1.1579623E+02
246.0	S	9 +1.1603770E+02	+4.7261802E+00	+1.2650000E+02	+1.0500000E+02	+1.1907600E+02
254.0	S	9 +1.1764436E+02	+2.0108475E+00	+1.2186599E+02	+1.1573999E+02	+1.2032543E+02
259.0	J	5 +1.2278881E+02	+7.6935675E+00	+1.31895599E+02	+1.119959E+02	+1.2110633E+02
265.0	S	9 +1.2461433E+02	+2.4927572E+00	+1.2873555E+02	+1.2133999E+02	+1.2204341E+02

STAGE 1, DISCRETE MCTCR=0012029, EIA XIAL CHS=2.0 IN/MIN. STRESS AT RUPT.

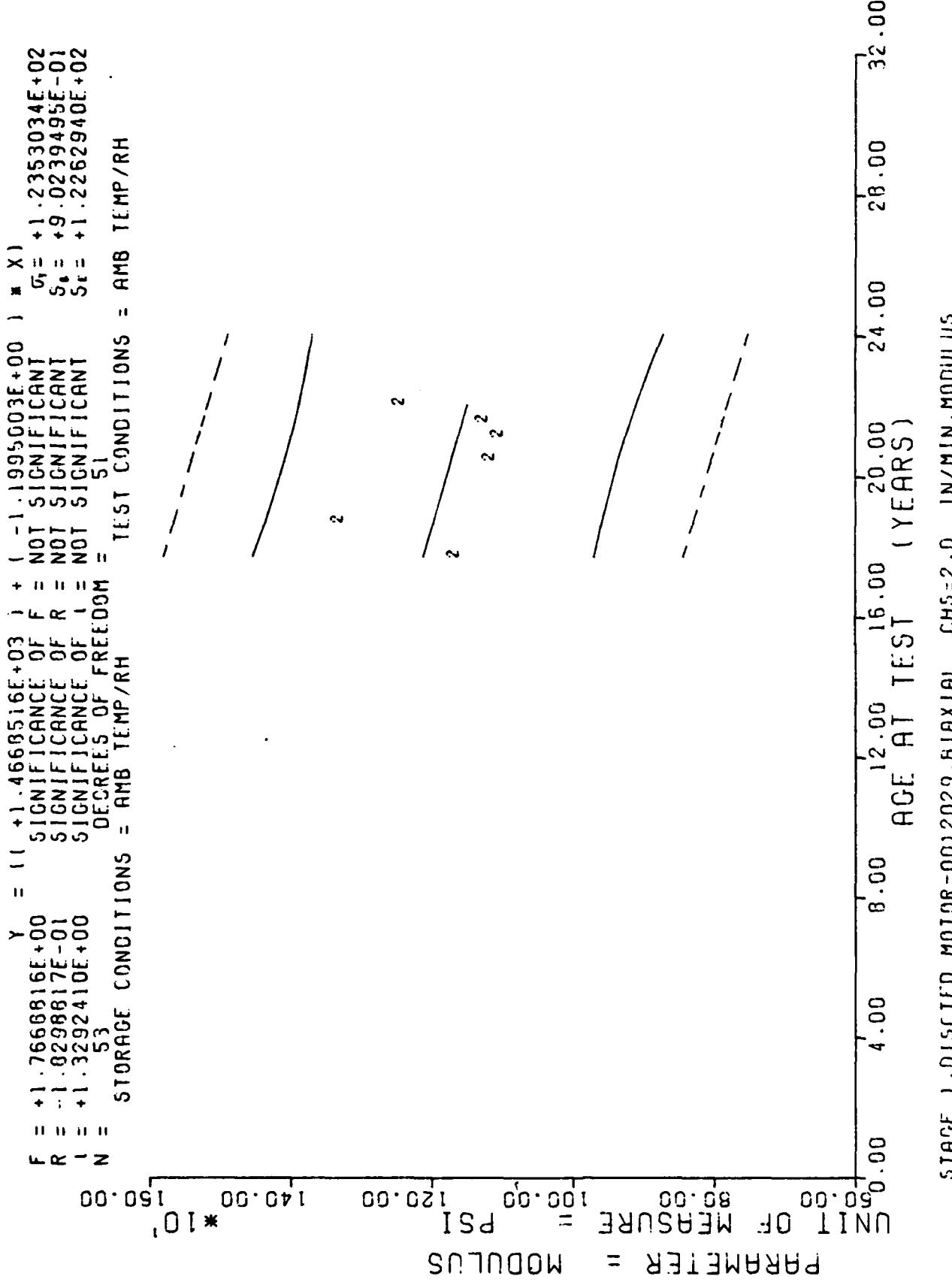


Figure 60

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+1.1617775E+03	+3.7295367E+01	+1.2300000E+03	+1.0950000E+03	+1.2113579E+03
225.0	8	+1.2265000E+03	+1.4839715E+02	+1.4970000E+03	+1.0730000E+03	+1.1969638E+03
246.0	9	+1.111665E+03	+8.3842113E+01	+1.2050000E+03	+9.1400000E+02	+1.1717744E+03
254.0	9	+1.100443E+03	+1.1168382E+02	+1.2690000E+03	+8.9500000E+02	+1.1621784E+03
259.0	9	+1.1217775E+03	+9.0756236E+01	+1.3120000E+03	+9.9800000E+02	+1.1561809E+03
265.0	9	+1.2396665E+03	+9.4803744E+01	+1.3740000E+03	+1.0570000E+03	+1.1469838E+03

STAGE 1, DISCTED MCTCR=0012029, EIAZIAL CHS=2.0 IN/MIN,MODULUS

PARAMETER = STRAIN AT MAX STRESS

0.20 0.24 0.28 0.32 0.36 0.40

STAGE 1: DISCETED MONITOR=00012029, TRIAXIAL CHS=2.0 IN/MIN, 8000 PSI, STRAIN MAX STRS

Figure 61

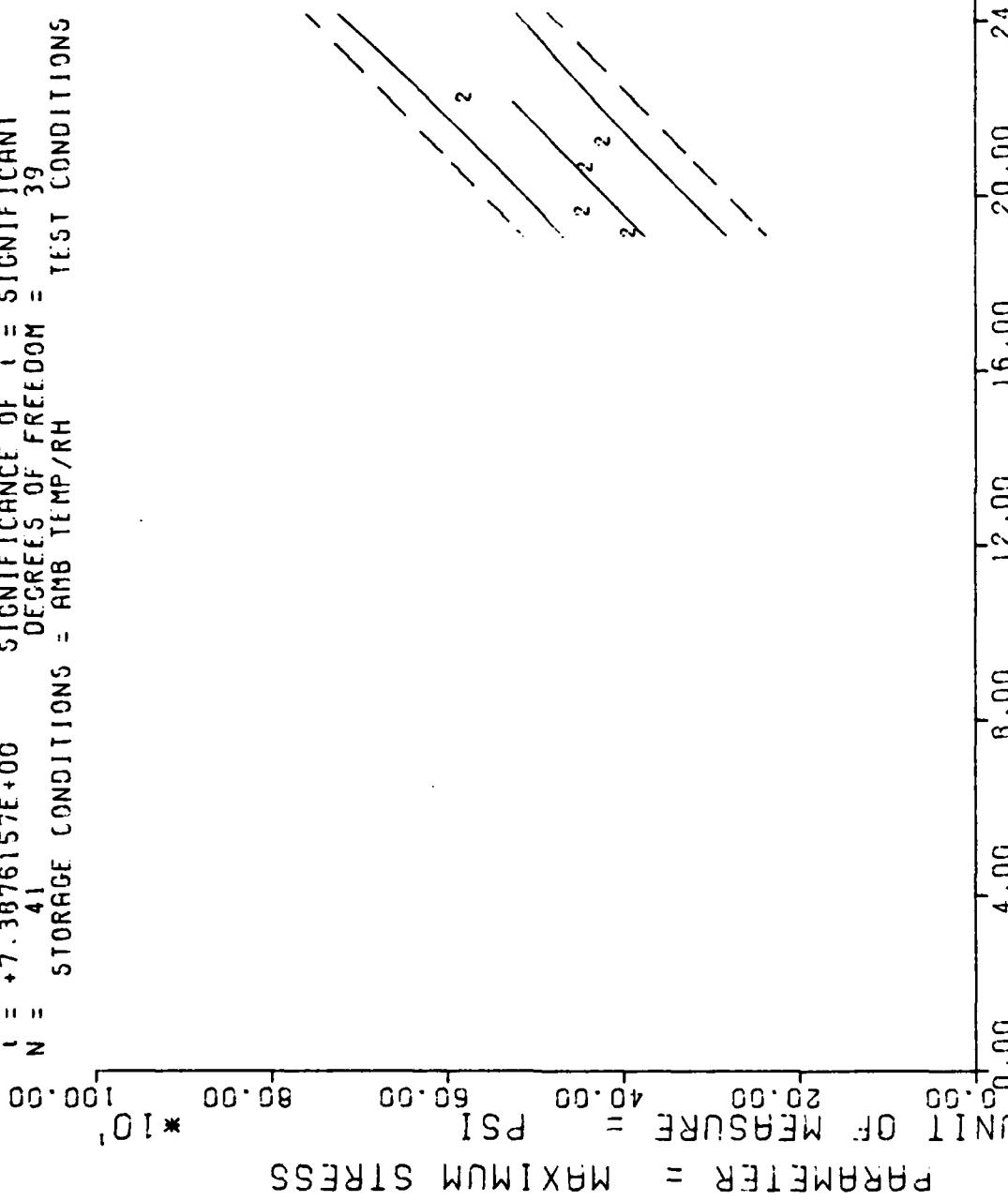
\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
229.0	8	+2.8249579E-01	+1.0944922E-02	+2.9409998E-01	+2.6699995E-01	+2.9207217E-01
235.0	5	+2.7939587E-01	+1.4193042E-02	+2.9299998E-01	+2.5899994E-01	+2.8902834E-01
247.0	9	+3.0091083E-01	+1.5466383E-02	+3.2999998E-01	+2.7099996E-01	+2.8294068E-01
254.0	10	+2.8582973E-01	+1.1969529E-02	+3.0289995E-01	+2.6699995E-01	+2.7938956E-01
266.0	9	+2.5756856E-01	+5.7860809E-03	+2.7139997E-01	+2.4569994E-01	+2.7330189E-01

STAGE 1, DISCTED MCTDR=0012029, TRIAXIAL CHS=2.0 IN/MIN,800 PSI, STRAIN MAX STRS.

$Y = (( -5.5042268E+02 ) + ( +4.0432142E+00 ) * X_1 )$   
 $F = +5.4576866E+01$  SIGNIFICANCE OF  $F = \text{SIGNIFICANT}$   $\sigma_E = +7.0124749E+01$   
 $R = +7.6369517E-01$  SIGNIFICANCE OF  $R = \text{SIGNIFICANT}$   $S_1 = +5.4729623E-01$   
 $1 = +7.3876157E+00$  SIGNIFICANCE OF  $1 = \text{SIGNIFICANT}$   $S_2 = +4.5847648E+01$   
 $N = 41$  DEGREES OF FREEDOM = 39  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 30 DEG F.



STAGE 1, DISC'D MOTOR=0012029, TRIAXIAL CHS=2.0 IN/MIN, 600 PSI, MAX STRS

Figure 62

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
229.0	8	+3.6673852E+02	+1.3693375E+01	+4.0655985E+02	+3.6819995E+02	+3.7547314E+02
235.0	5	+4.3934965E+02	+8.1187449E+00	+4.5250976E+02	+4.3250976E+02	+3.9973266E+02
247.0	9	+4.3545975E+02	+2.9421108E+01	+4.8379580E+02	+4.0279980E+02	+4.4825122E+02
254.0	10	+4.1576367E+02	+1.4631364E+01	+4.3847598E+02	+3.8353979E+02	+4.7655371E+02
266.0	9	+5.7334399E+02	+2.0310156E+01	+6.0600000E+02	+5.4969995E+02	+5.2507226E+02

STAGE 1.0 DISCTED NCTCR=9012029, TRIAXIAL CHS=2.0 IN/MIN, 800 PSI MAX STRS.

$F = +7.9653862E+00$        $Y = (( +4.7599544E-01 ) + (-6.9460972E-04 ) * X)$   
 $R = .4.1182671E-01$       SIGNIFICANCE OF  $F = \sigma_F = +2.2340400E-02$   
 $\sigma = +2.0223019E+00$       SIGNIFICANCE OF  $R = \sigma_R = +2.4611460E-04$   
 $N = 41$       SIGNIFICANCE OF  $\sigma = \sigma_\sigma = +2.0617309E-02$   
 $D$       DEGREES OF FREEDOM = 39  
 $S$       STORAGE CONDITIONS = AMB TEMP/RH      TEST CONDITIONS = 30 DEC F.

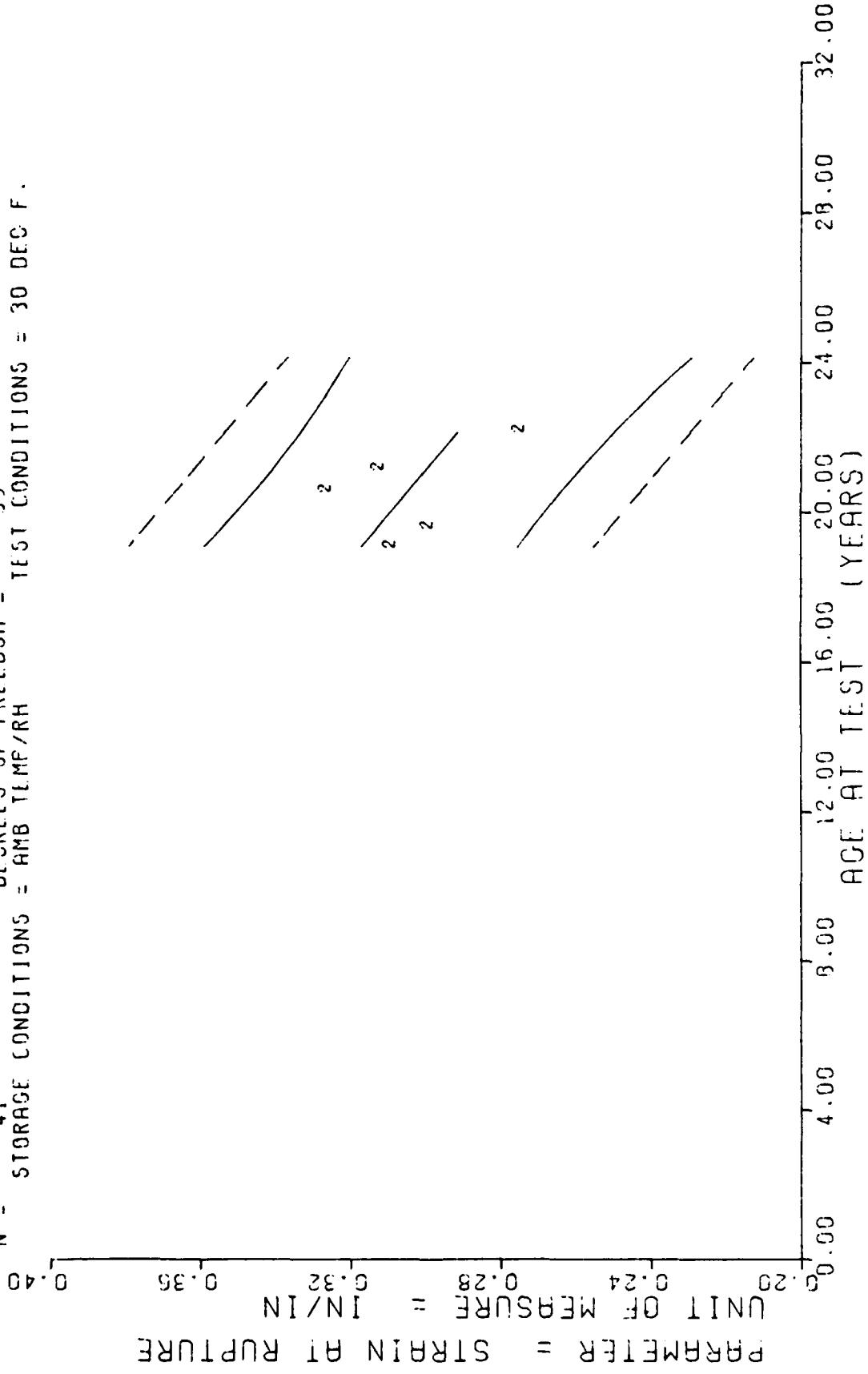


Figure 63

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

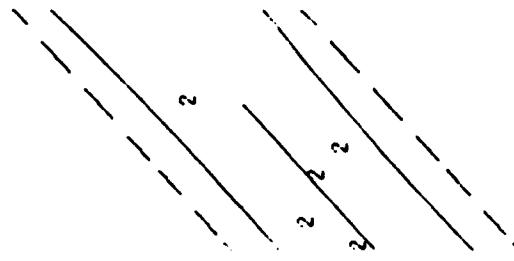
\*\*\*\* ANALYSIS OF TIME SERIES \*\*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
229.0	8	+3.0793714E-01	+1.3333155E-02	+3.2455558E-01	+2.9099994E-01	+3.1692981E-01
235.0	5	+2.5795973E-01	+1.4339690E-02	+3.0999994E-01	+2.7399998E-01	+3.1276214E-01
247.0	9	+3.2522189E-01	+1.5808205E-02	+3.5999555E-01	+3.0499954E-01	+3.0442678E-01
254.0	10	+3.1117563E-01	+1.5097183E-02	+3.2899599E-01	+2.7799959E-01	+2.9956454E-01
266.0	9	+2.7372167E-01	+9.4994652E-03	+2.8689598E-01	+2.5769996E-01	+2.0122924E-01

STAGE 1, DISCTED MCTOR=0012029, TRIAXIAL CHS=2.0 IN/MIN,800 PSI, STRAIN AT RUPT.

$F = +3.9506432E+01$        $Y = 11(-5.1552857E+02)$        $+ ( +3.0449362E+00 ) * X_1$   
 $R = +7.0936383E-01$       SIGNIFICANCE OF  $F =$  SIGNIFICANT  
 $^1 = +6.2854142E+00$       SIGNIFICANCE OF  $R =$  SIGNIFICANT  
 $N = 41$       SIGNIFICANCE OF  $^1 =$  SIGNIFICANT  
 DEGREES OF FREEDOM = 39      TEST CONDITIONS = 30 DEG F.

PARAMETER = STRESS AT RUPTURE  
 UNIT OF MEASURE = PSI  
 0.00 20.00 40.00 60.00 80.00 \*10.  
 100.00



STAGE 1. DISCETED MOTOR=0012029, TRIAXIAL CHS=2.0 IN/MIN, 600 PSI, STRESS AT RUPT.

Figure 64

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
229.0	8	+3.7602856E+02	+1.3652747E+01	+4.0027578E+02	+3.6089990E+02	+3.6496166E+02
235.0	5	+4.3171972E+02	+3.5091338E+00	+4.3689590E+02	+4.2729980E+02	+3.8803125E+02
247.0	9	+4.2119213E+02	+3.0386347E+01	+4.8015555E+02	+3.8482983E+02	+4.3417065E+02
254.0	10	+3.5584985E+02	+3.6211643E+01	+4.2609985E+02	+2.9989990E+02	+4.6108520E+02
266.0	9	+5.5657763E+02	+2.1043610E+01	+5.9315555E+02	+5.3650000E+02	+5.0722436E+02

STAGE 1, DISCTED MCTCR=00112029, TRIAXIAL CHS=2.0 IN/MIN.800 PSI,STRESS AT RUPT.

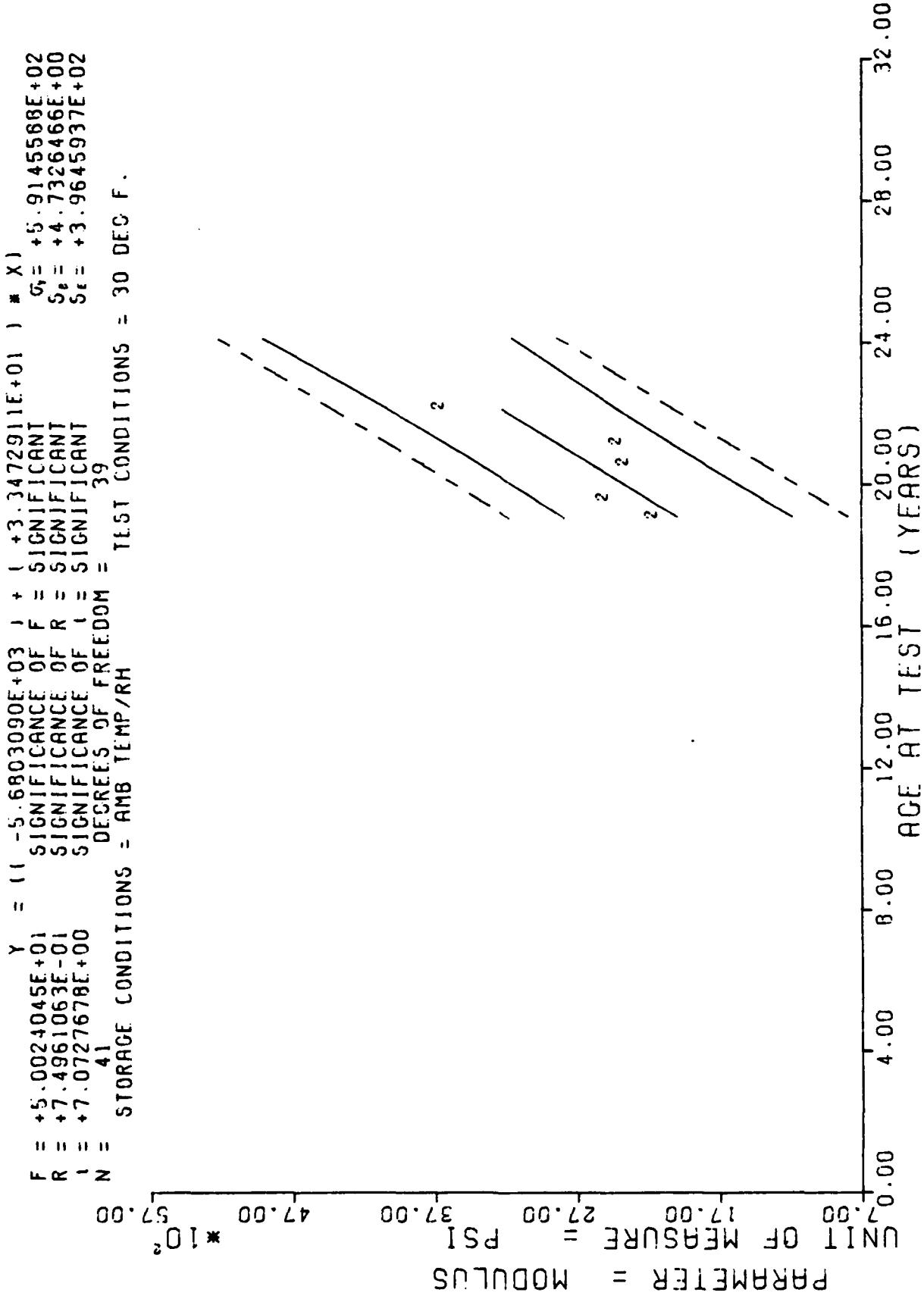


Figure 65

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
229.0	8	+2.1417500E+03	+1.4517354E+02	+2.3500000E+03	+1.9480000E+03	+1.9849875E+03
235.0	5	+2.4866000E+03	+1.997749E+02	+2.7440000E+03	+2.2140000E+03	+2.1858249E+03
247.0	9	+2.3945554E+03	+2.6625110E+02	+2.7890000E+03	+1.9520100E+03	+2.5875000E+03
254.0	10	+2.3935998E+03	+1.7318147E+02	+2.7590000E+03	+2.1970000E+03	+2.8218103E+03
266.0	9	+3.6361110E+03	+2.3475588E+02	+3.5960000E+03	+3.3520000E+03	+3.2234953E+03

STAGE 1, DISCTED MC1CR=0012029, TRIAXIAL CHS=2.0 IN/MIN, 800 PSI, MODULUS

$F = 4.7068952E+01$     $Y = 11 + 1.7007897E-01$     $I = 6.0779030E-04$     $\sigma_x = 1.6444822E-02$   
 $R = 6.6615167E-01$    SIGNIFICANCE OF F = SIGNIFICANT    $S_x = 8.0590367E-05$   
 $L = 6.0606816E+00$    SIGNIFICANCE OF R = SIGNIFICANT    $S_y = 1.2368319E-02$   
 $N = 61$    SIGNIFICANCE OF I = SIGNIFICANT  
 DEGREES OF FREEDOM = 59   TEST CONDITIONS = AMB TEMP/RH  
 STORAGE CONDITIONS = AMB TEMP/RH

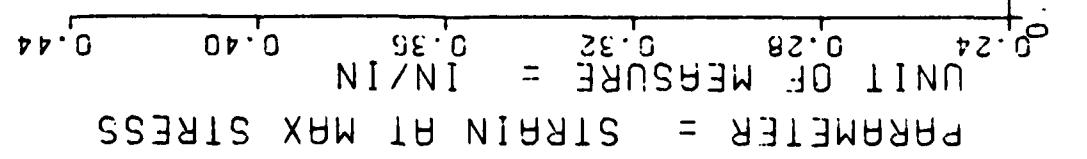


Figure 66

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+3.02866851E-01	+5.1044502E-03	+3.0899555E-01	+2.9399996E-01	+2.9953831E-01
225.0	8	+3.0417478E-01	+1.8438787E-02	+3.2669557E-01	+2.7499997E-01	+3.0683177E-01
235.0	9	+3.1155573E-01	+9.7155889E-03	+3.3059557E-01	+3.0099999E-01	+3.1290966E-01
246.0	8	+3.1992459E-01	+1.2902579E-02	+3.3995557E-01	+2.9999955E-01	+3.1959533E-01
254.0	9	+3.1566625E-01	+8.6295924E-03	+3.2495558E-01	+3.0099999E-01	+3.2445770E-01
259.0	9	+3.2422183E-01	+1.64156889E-02	+3.6099594E-01	+3.1799995E-01	+3.2749664E-01
266.0	9	+3.2344405E-01	+9.3108053E-03	+3.5495555E-01	+3.2499998E-01	+3.3175116E-01

STAGE 1. DISCTED MCTCR=0012029, TRIAXIAL CHS=2.0 IN/MIN.800 PSI, STRAIN MAX STRS.

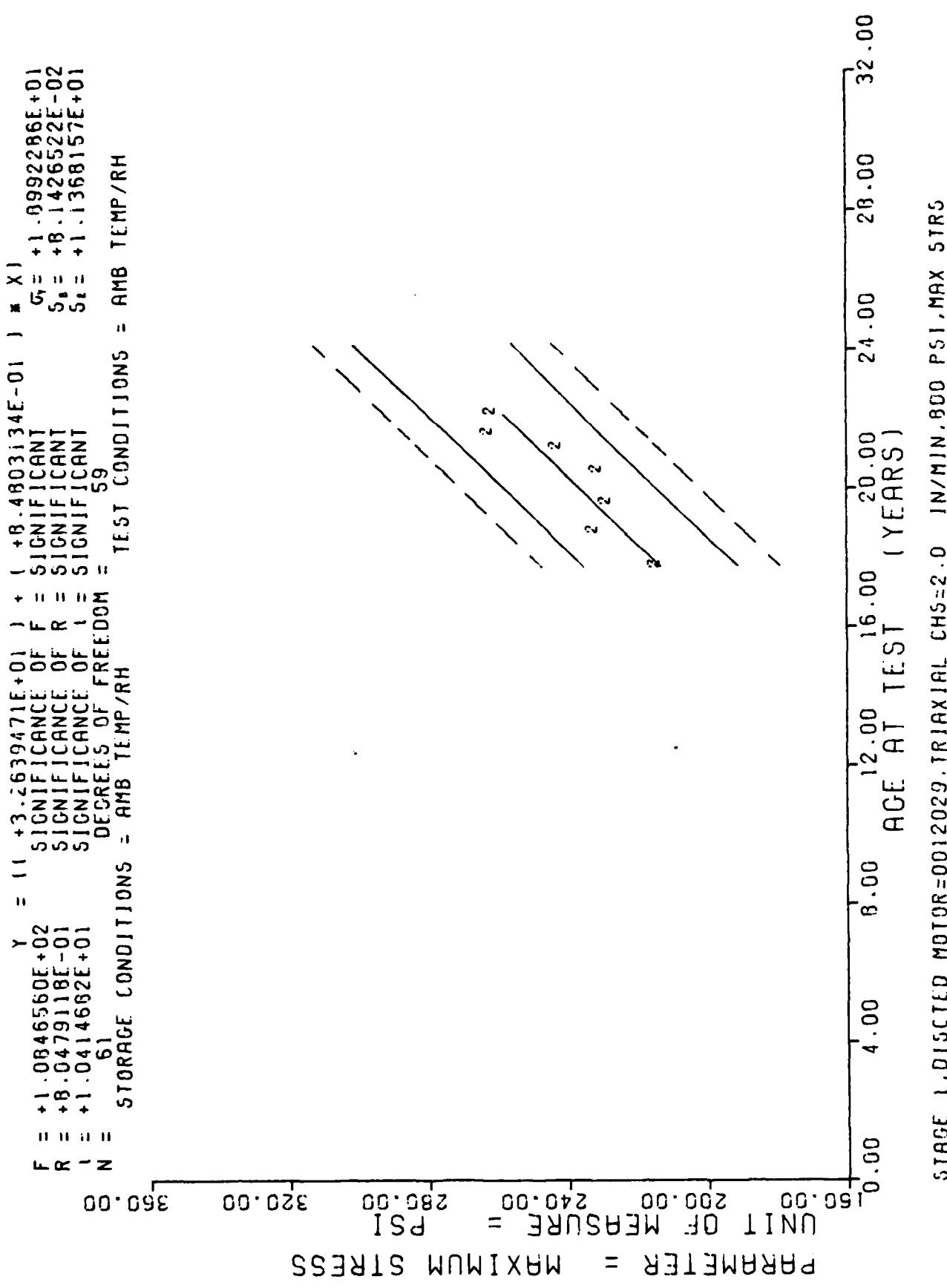


Figure 67

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+2.1384326E+02	+5.5003949E+00	+2.2282558E+02	+2.0338959E+02	+2.1327014E+02
225.0	8	+2.153613E+02	+4.8527034E+00	+2.3952599E+02	+2.2530999E+02	+2.2344651E+02
235.0	9	+2.2778881E+02	+5.6547584E+00	+2.3565599E+02	+2.1779958E+02	+2.3192683E+02
246.0	8	+2.2045243E+02	+1.2246568E+01	+2.4205599E+02	+2.0716999E+02	+2.4125517E+02
254.0	9	+2.4205434E+02	+9.5652056E+00	+2.5935590E+02	+2.2589999E+02	+2.4803942E+02
259.0	9	+2.6167187E+02	+1.5348601E+01	+2.8714590E+02	+2.4127959E+02	+2.5227958E+02
266.0	9	+2.6670674E+02	+7.5309330E+00	+2.7185590E+02	+2.5329999E+02	+2.5821557E+02

STAGE 1. DISCTED MCTCR=0012029, TRIAXIAL CHS=2.0 IN/MIN.000 PSI, MAX STRS.

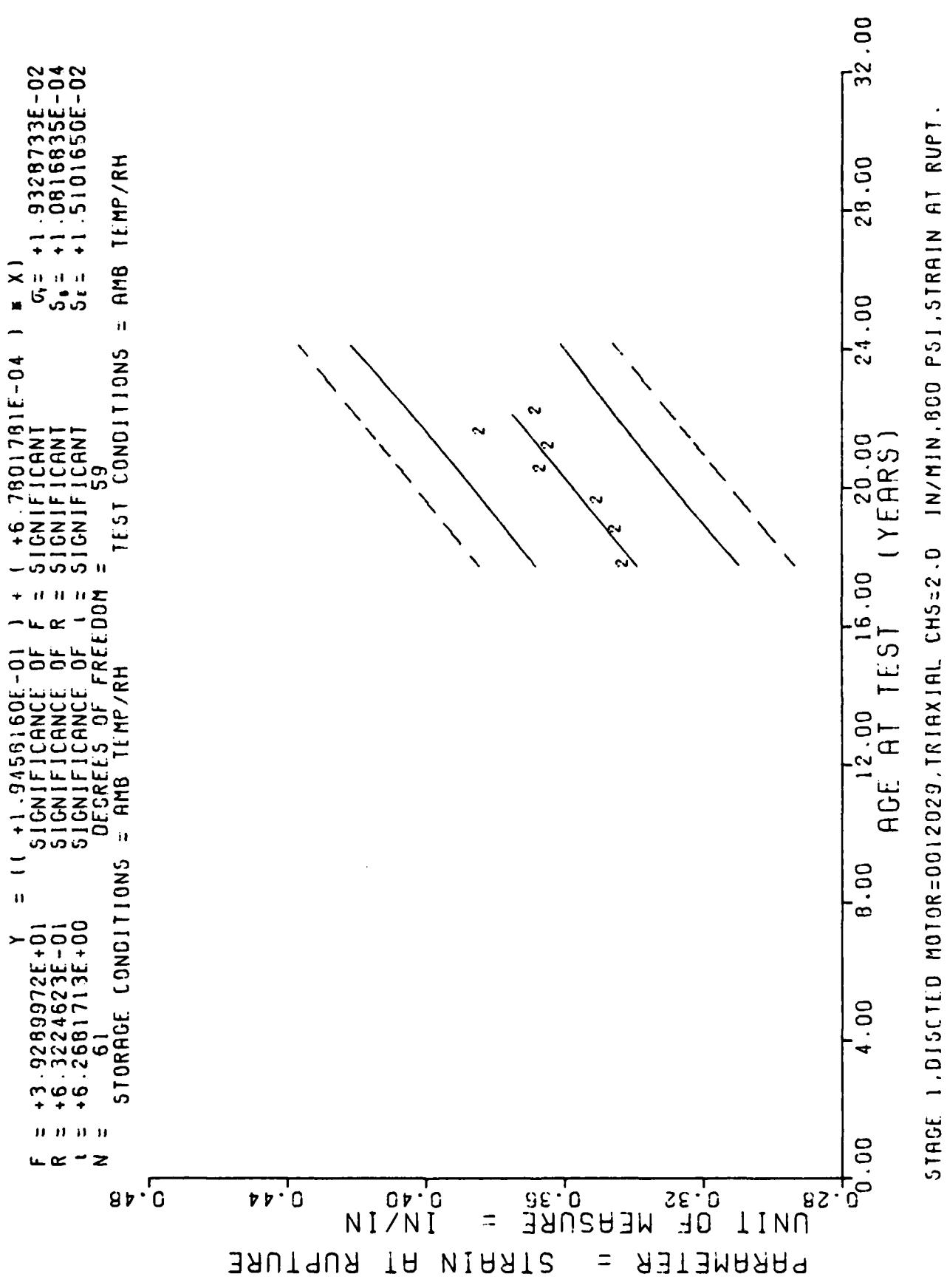


Figure 68

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

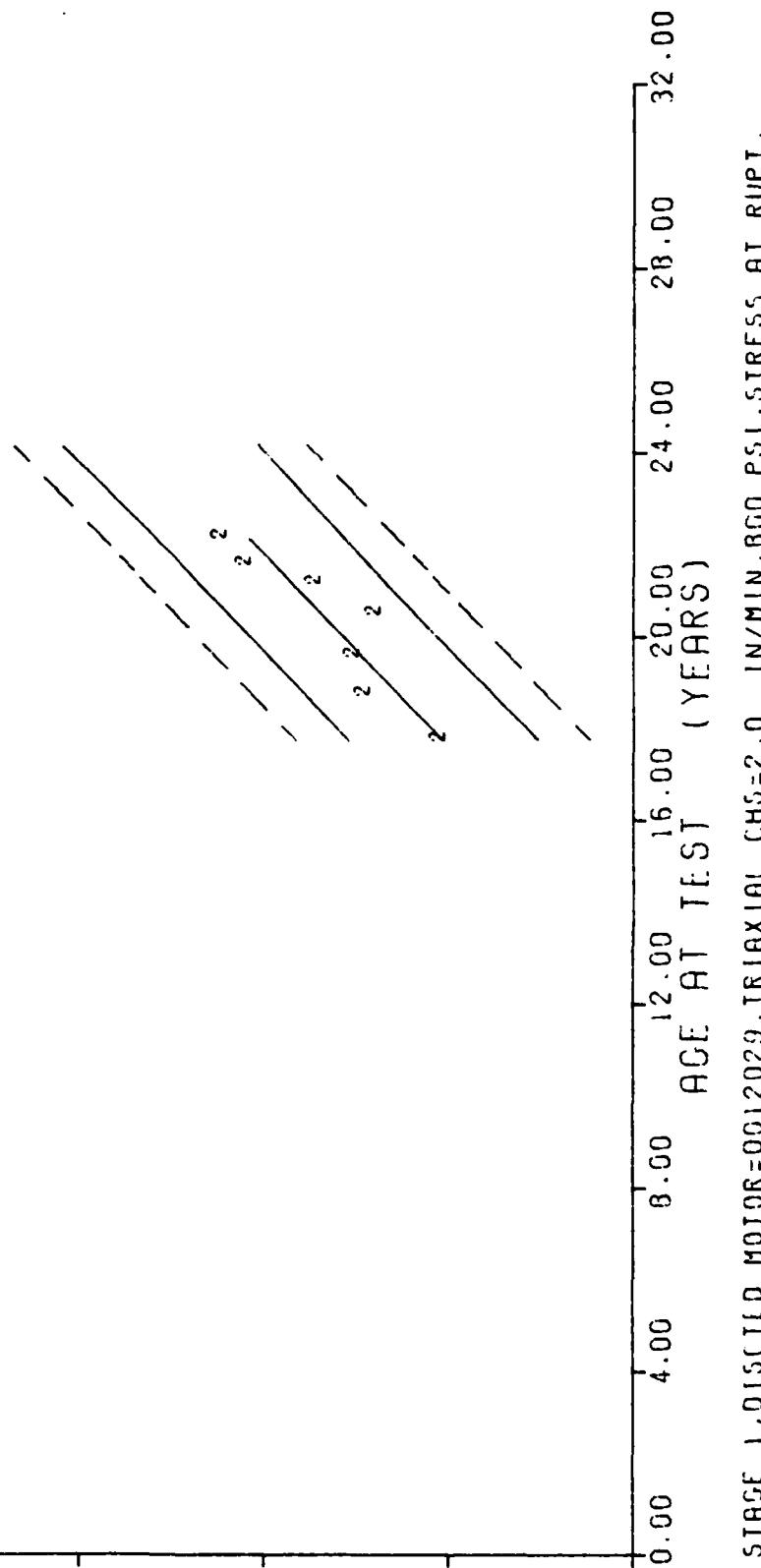
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION Y	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+3.04177726E-01	+8.4886625E-03	+3.5199599E-01	+3.23999994E-01	+3.3899939E-01
225.0	8	+3.04282462E-01	+2.2885544E-02	+3.7709599E-01	+3.1399955E-01	+3.4713560E-01
235.0	9	+3.04911078E-01	+6.7583454E-03	+3.6095594E-01	+3.3699995E-01	+3.5391575E-01
246.0	8	+3.0652466E-01	+1.1667294E-02	+3.8399594E-01	+3.4499996E-01	+3.6137396E-01
254.0	9	+3.06322164E-01	+1.2247465E-02	+3.7695597E-01	+3.3899599E-01	+3.6679810E-01
259.0	9	+3.08255547E-01	+1.5504809E-02	+4.1569594E-01	+3.6099994E-01	+3.7018817E-01
266.0	9	+3.06666846E-01	+9.5593596E-03	+3.8295595E-01	+3.5099995E-01	+3.7493431E-01

STAGE 1.0 DISCTED MCTCR=0012029, TRIAXIAL CHS=2.0 IN/MIN.800 PSI, STRAIN AT RUPT.

$F = +1.0947905E+02$        $Y = (1 + 3.2513407E+01) + ( +7.9224037E-01) * X$   
 SIGNIFICANCE OF F = SIGNIFICANT       $G_1 = +1.7713850E+01$   
 SIGNIFICANCE OF R = SIGNIFICANT       $S_0 = +7.5716660E-02$   
 SIGNIFICANCE OF  $\beta$  = SIGNIFICANT       $S_{\beta} = +1.0570989E+01$   
 DEGREES OF FREEDOM = 59

STORAGE CONDITIONS = AMB TEMP/RH

PARAMETER = STRESS AT RUPTURE  
 UNIT OF MEASURE = PSI  
 0.00 4.00 8.00 12.00 16.00 20.00 24.00 28.00 32.00 36.00



STAGE 1, DISC110 MOTOR=0012029, TRIAXIAL CHS=2.0 IN/MIN, 800 PSI, STRESS AT RUPT.

Figure 69

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+2.0104765E+02	+6.6645567E+00	+2.3939559E+02	+1.9216955E+02	+2.0126060E+02
225.0	8	+2.1725241E+02	+8.2412542E+00	+2.2660558E+02	+2.0430999E+02	+2.1076748E+02
235.0	9	+2.155589E+02	+5.0014006E+00	+2.2689559E+02	+2.1439959E+02	+2.1868988E+02
235.0	8	+2.1491241E+02	+9.7163895E+00	+2.2609559E+02	+1.9619959E+02	+2.2740452E+02
246.0	8	+2.2767589E+02	+9.0564708E+00	+2.4222559E+02	+2.1078999E+02	+2.3374244E+02
254.0	9	+2.4208880E+02	+1.2705615E+01	+2.6419555E+02	+2.2950000E+02	+2.3770365E+02
259.0	9	+2.4855322E+02	+8.0747292E+00	+2.6165595E+02	+2.4109559E+02	+2.4324934E+02
266.0	9	+2.4855322E+02				

STAGE 1, DISCTED NCTCR=0012029, TRIAXIAL CHS=2.0 IN/MIN.800 PSI. STRESS AT RUPT.

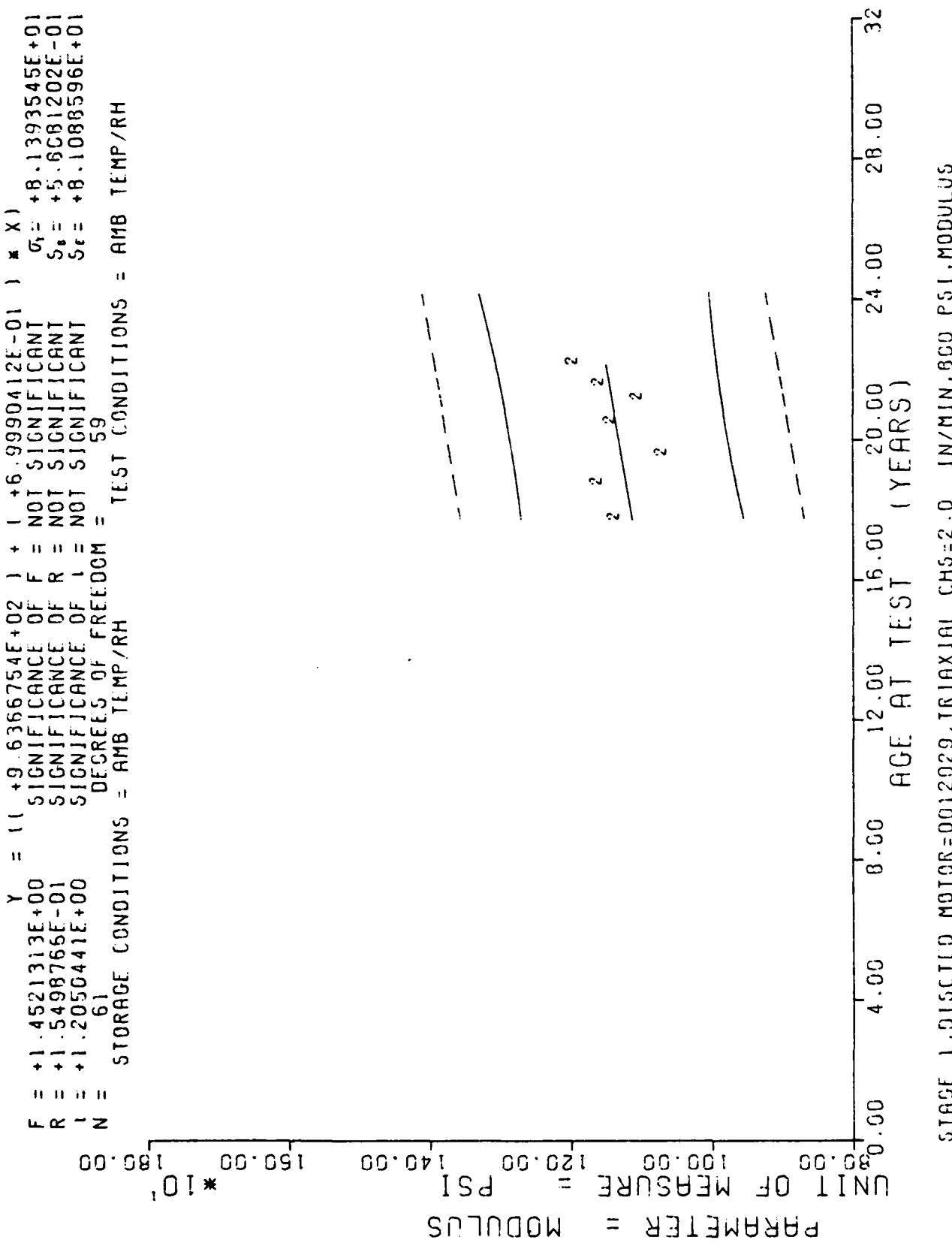


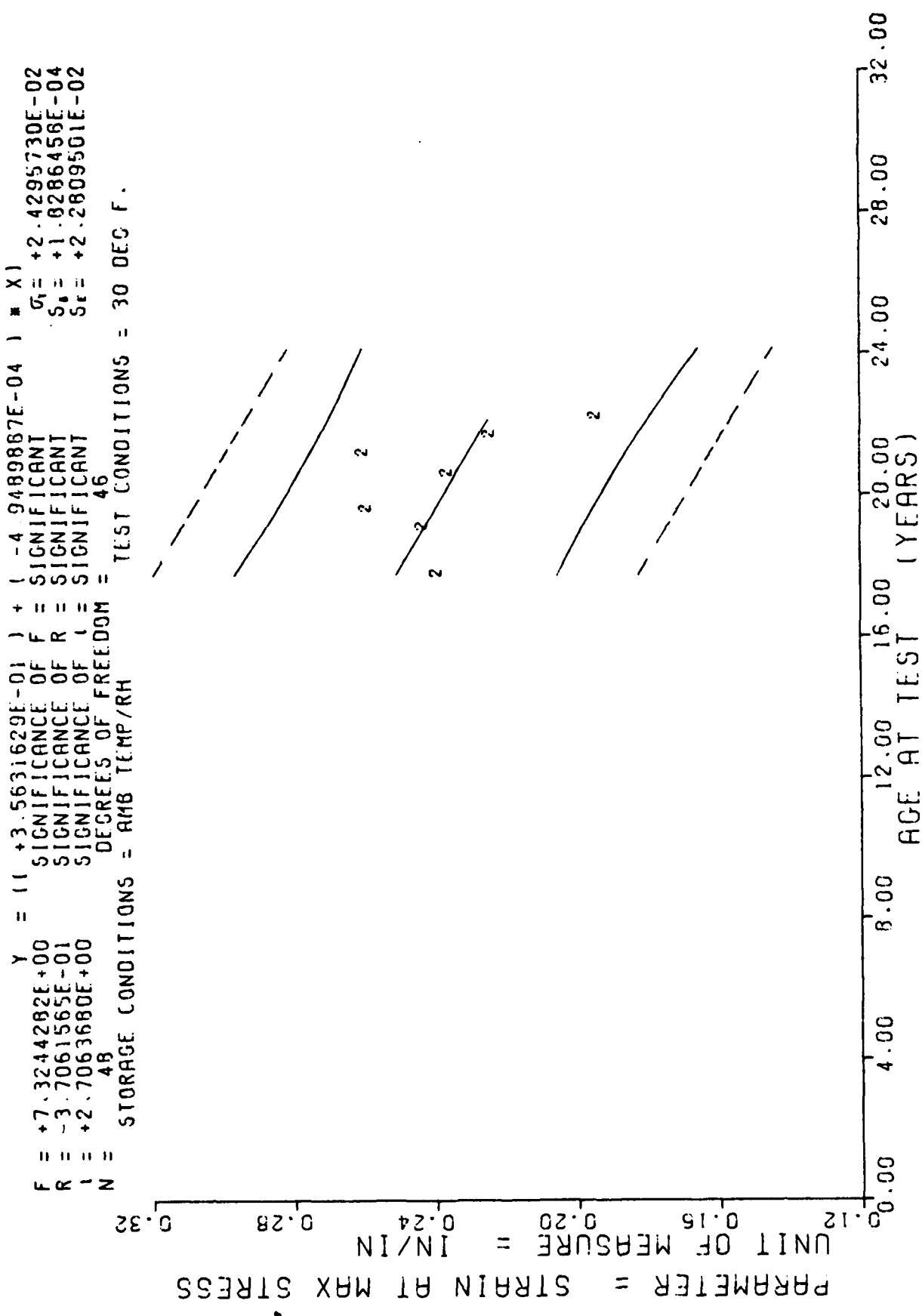
Figure 70

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+1.132443E+03	+4.2021158E+01	+1.1840000E+03	+1.0640000E+03	+1.1127470E+03
225.0	8	+1.1562750E+03	+1.1658404E+02	+1.3570000E+03	+1.0340000E+03	+1.1211457E+03
235.0	9	+1.0651110E+03	+3.6563079E+01	+1.1170000E+03	+1.0080000E+03	+1.1281447E+03
246.0	8	+1.1376750E+03	+8.5066070E+01	+1.2650000E+03	+1.0170000E+03	+1.1358437E+03
254.0	9	+1.1002221E+03	+6.4375418E+01	+1.22406000E+03	+1.0040000E+03	+1.1414431E+03
259.0	9	+1.154443E+03	+9.2857567E+01	+1.3250000E+03	+1.0400000E+03	+1.1449426E+03
266.0	9	+1.1512332E+03	+6.3186232E+01	+1.3440000E+03	+1.1390000E+03	+1.1498417E+03

STAGE 1, DISCTED NCTCR=0012029, TRIAXIAL CHS=2.0 IN/MIN,800 PSI,MODULUS



STAGE 1, DISC T'D MOTOR=0012029, TRIAXIAL CHS=20.0 IN/MIN, 800 PSI, STRAIN MAX STRS.

Figure 71

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIAION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+2.3811084E-01	+6.3594517E-03	+2.5199957E-01	+2.3199999E-01	+2.5090283E-01
229.0	5	+2.4209594E-01	+1.0583296E-02	+2.5339596E-01	+2.2839999E-01	+2.4298441E-01
235.0	5	+2.5755577E-01	+1.1601533E-02	+2.7799999E-01	+2.4899995E-01	+2.4001502E-01
247.0	9	+2.3499971E-01	+1.092071E-02	+2.44999594E-01	+2.1999996E-01	+2.3407626E-01
254.0	10	+2.5673965E-01	+1.5381349E-02	+2.88999597E-01	+2.3899996E-01	+2.3061192E-01
260.0	2	+2.2299993E-01	+1.4077184E-03	+2.2399997E-01	+2.2199994E-01	+2.2764253E-01
266.0	8	+1.9332732E-01	+1.0449113E-02	+2.0589595E-01	+1.7599999E-01	+2.2467315E-01

STAGE 1. DISCTED MC1CR=0012029. TRIAXIAL CH5=20.0 IN/MIN.800 PSI. STRAIN MAX STRS.

$Y = (1 - 3.9061492E+02) + (4.2473142E+00) * X_1$   
 $F = 3.2969635E+01$  SIGNIFICANCE OF  $F$  = SIGNIFICANT  
 $R = 6.4614056E-01$  SIGNIFICANCE OF  $R$  = SIGNIFICANT  
 $1 = 5.7419191E+00$  SIGNIFICANCE OF  $1$  = SIGNIFICANT  
 $N = 48$  DEGREES OF FREEDOM = 46  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 30 DEG F.

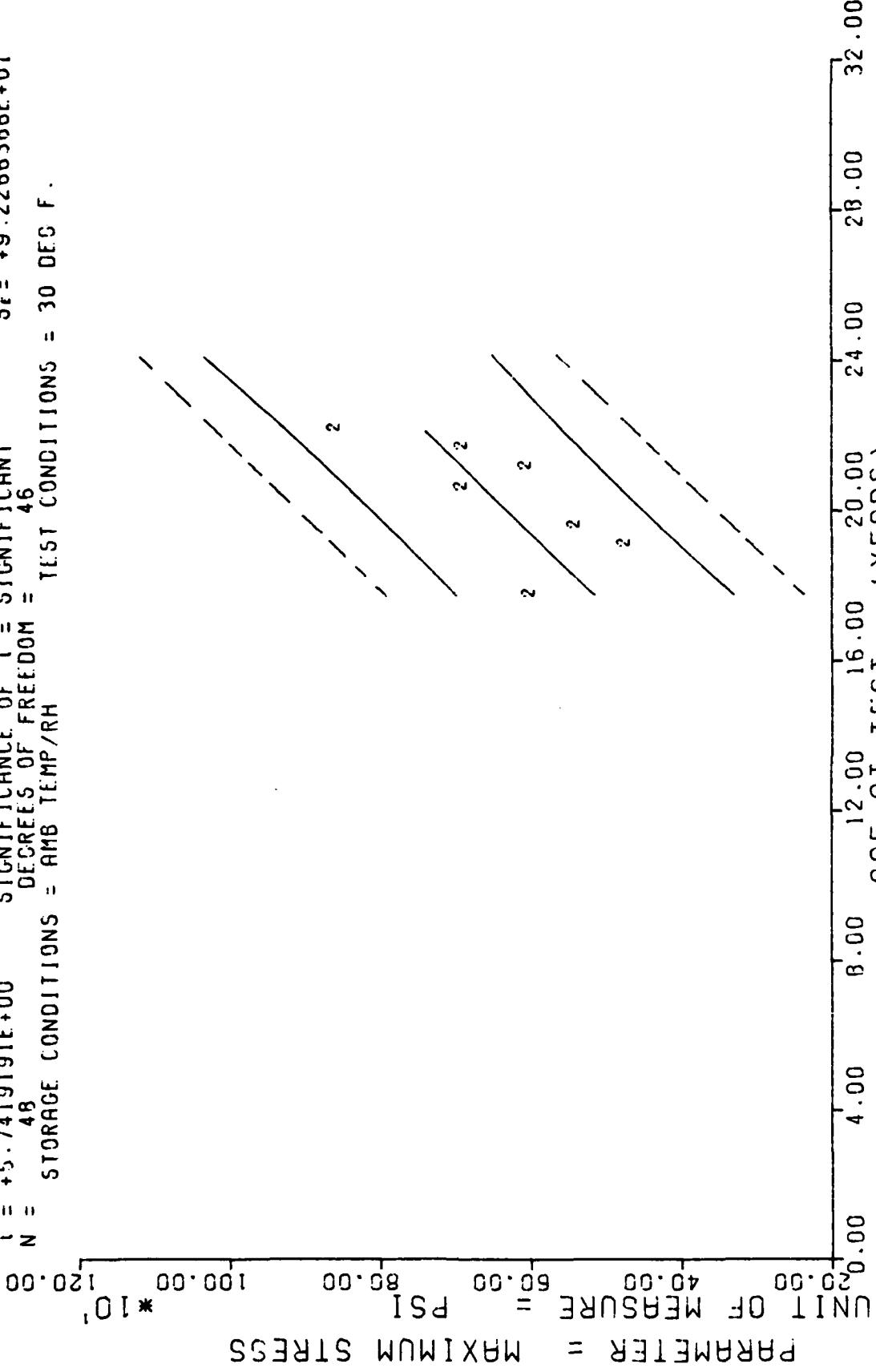


Figure 72

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
21.3.0	9	+5.5521044E+02	+2.2386125E+01	+6.4385690E+02	+5.6919955E+02	+5. 1406298E+02
22.0.0	5	+4.6511572E+02	+4.0719398E+01	+5.2419595E+02	+4.2707983E+02	+5. 8202001E+02
23.5.0	5	+5.3457583E+02	+2.4247393E+01	+5.7385590E+02	+5.0839950E+02	+6. 0750390E+02
24.7.0	9	+6.8474389E+02	+5.4339018E+01	+7.6759585E+02	+6.0950000E+02	+6. 5847167E+02
25.4.0	10	+5.5542211E+02	+2.1626821E+01	+6.4805585E+02	+5.7429980E+02	+6. 8820288E+02
26.0.0	2	+6.8400000E+02	+3.7476659E+01	+7.1050000E+02	+6.5750000E+02	+7. 1368676E+02
26.6.0	E	+8.5286083E+02	+3.7029144E+01	+8.5405585E+02	+7.8450000E+02	+7. 3917065E+02

STAGE 1, DISCTED MCTCR=J012029, TRIAXIAL CHS=20.0 IN/MIN.800 PSI, MAX STFS.

$F = +7.4239067E+00$        $Y = ( ( +3.964288E-01 ) + ( -5.9827320E-04 ) * X )$   
 $R = -3.7277641E-01$        $F = \text{SIGNIFICANT}$   
 $I = +2.7246847E+00$        $R = \text{SIGNIFICANT}$   
 $N = 48$        $I = \text{SIGNIFICANT}$   
 $\text{STORAGE CONDITIONS} = \text{AMB TEMP/RH}$        $\text{DEGREES OF FREEDOM} = 46$   
 $\text{TEST CONDITIONS} = 30 \text{ DEG F.}$

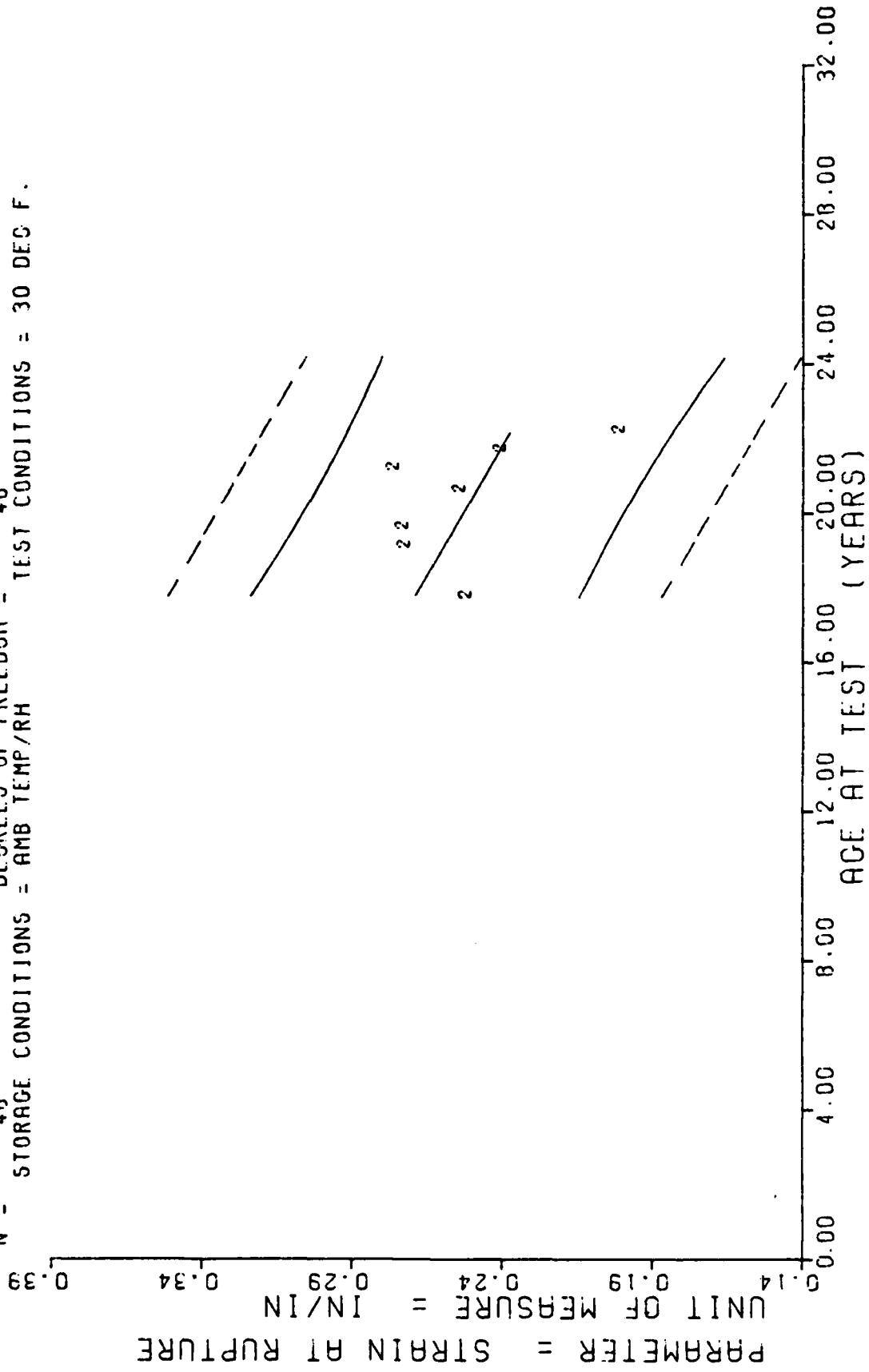


Figure 73

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
21.3.0	9	+2.5055521E-01	+5.6387161E-03	+2.5459559E-01	+2.3699998E-01	+2.6859665E-01
22.9.0	5	+2.7075581E-01	+1.6487156E-02	+2.9899596E-01	+2.4799956E-01	+2.5942426E-01
23.5.0	5	+2.7125567E-01	+1.684571E-02	+2.8799598E-01	+2.6299955E-01	+2.5583463E-01
24.7.0	9	+2.5266623E-01	+1.4298541E-02	+2.7399598E-01	+2.3099994E-01	+2.4865537E-01
25.4.0	10	+2.7455573E-01	+2.1326913E-02	+3.0299597E-01	+2.4099999E-01	+2.4446743E-01
26.0.0	2	+2.3855556E-01	+1.4211893E-03	+2.3999594E-01	+2.3799997E-01	+2.4087780E-01
26.6.0	8	+1.9548732E-01	+1.2604590E-02	+2.1389597E-01	+1.7779999E-01	+2.3728817E-01

STAGE 1, DISCTED MCTCR=0012029, TRIAXIAL CHS=20.0 IN/MIN, 800 PSI, STRAIN AT RUPT.

$F = +2.9752784E+01$     $Y = 11(-3.8028304E+02)$     $1 + 1.573279E+00$     $1 * X_1$   
 $R = +6.2670694E-01$    SIGNIFICANCE OF  $F =$  SIGNIFICANT  
 $1 = +5.4546113E+00$    SIGNIFICANCE OF  $R =$  SIGNIFICANT  
 $N = 48$    DEGREES OF FREEDOM = 46  
 STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = 30 DEG F.

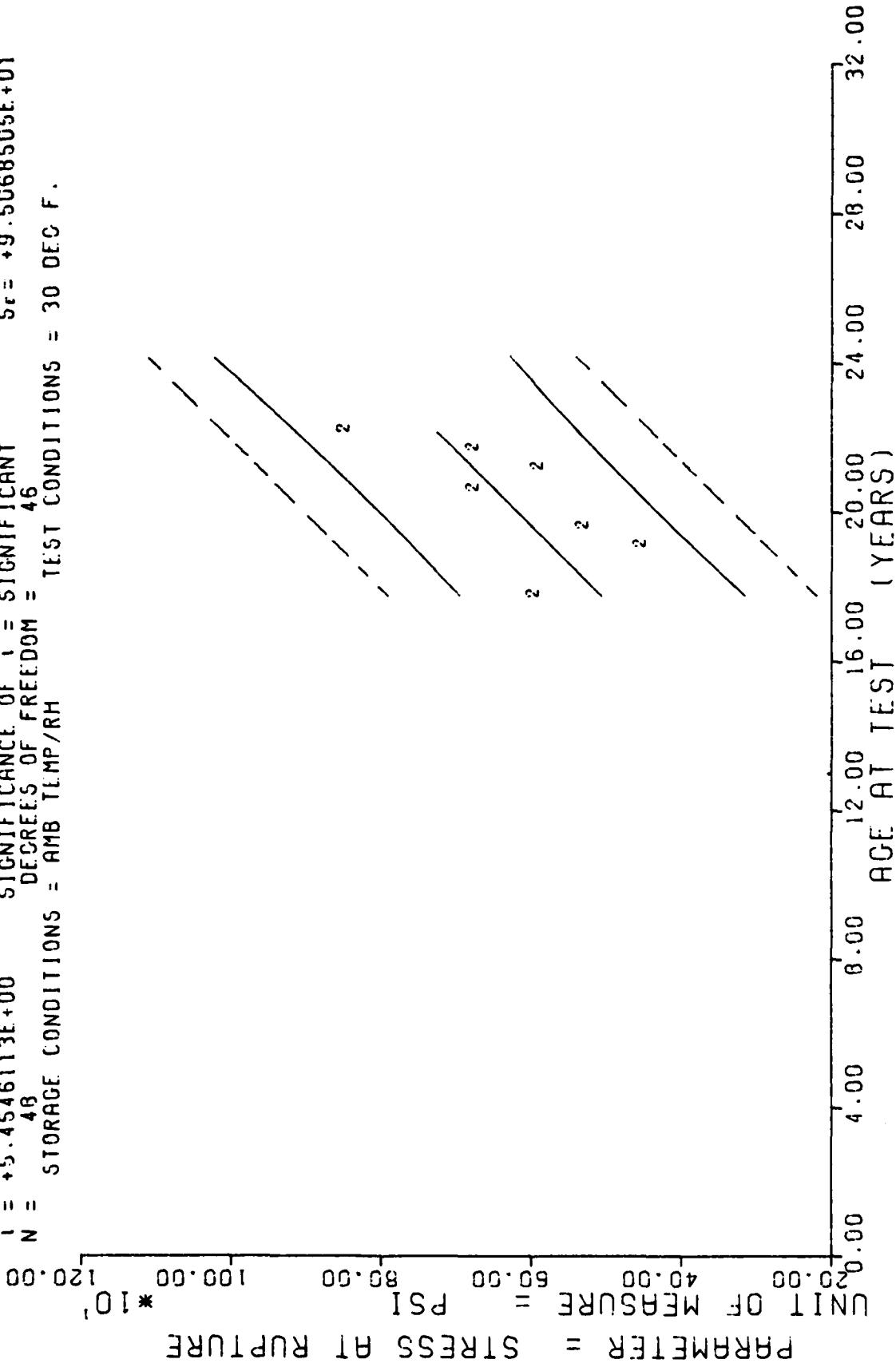


Figure 74

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+5.9059936E+02	+1.6129242E+01	+6.2439590E+02	+5.7100000E+02	+5.0522778E+02
229.0	5	+4.4857573E+02	+4.2715846E+01	+5.0600000E+02	+3.9769955E+02	+5.7174487E+02
235.0	5	+5.2521582E+02	+2.3690179E+01	+5.6365595E+02	+5.0269955E+02	+5.9668896E+02
247.0	9	+6.7129248E+02	+5.7093284E+01	+7.8889590E+02	+5.9809985E+02	+6.4657690E+02
10	+5.6544726E+02	+1.5703332E+01	+6.2800000E+02	+5.5929980E+02	+6.7567822E+02	
254.0	2	+6.7164990E+02	+3.3732474E+01	+6.9550000E+02	+6.4779980E+02	+7.0062207E+02
269.0	8	+8.4206056E+02	+3.3667954E+01	+8.8339590E+02	+7.7859985E+02	+7.2556616E+02
266.3						

STAGE 1. DISCTED MCTOR=0012029. TRIAXIAL CHS=20.0 IN/MIN.800 PSI. STRESS AT RUPT.

$F = +1.8347845E+01$        $Y = (( -4.8471856E+03 ) + ( +4.0932427E+01 ) * X)$   
 $R = +5.3398066E-01$        $F = \text{SIGNIFICANT}$   
 $\sigma = +4.2834305E+00$        $F = \text{SIGNIFICANT}$   
 $N = 48$        $R = \text{SIGNIFICANT}$   
 $\sigma = +1.1919565E+03$        $R = \text{SIGNIFICANT}$   
 $\text{DEGREES OF FREEDOM} = 46$   
 $\text{STORAGE CONDITIONS} = \text{AMB TEMP/RH}$        $\text{TEST CONDITIONS} = 30 \text{ DEC F.}$

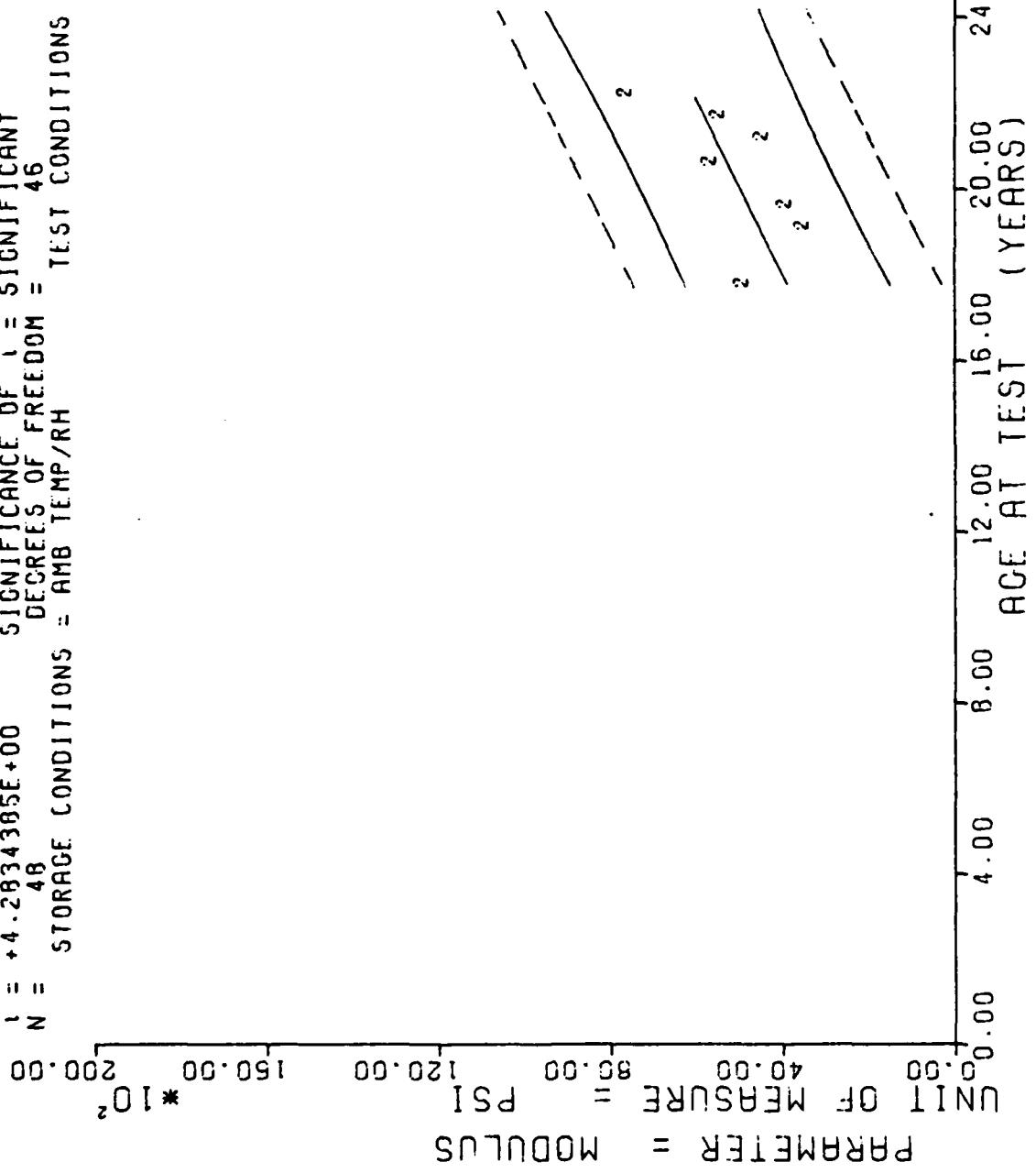


Figure 75

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\*\* ANALYSIS OF TIME SERIES \*\*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+ 4.8148867E+03	+ 3. 9162049E+02	+5. 4630000E+03	+4. 3570000E+03	+ 3. 871421E+03
229.0	5	+ 3. 4125558E+03	+ 4. 4464037E+02	+ 3. 9320000E+03	+ 2. 9130000E+03	+ 4. 526339E+03
235.0	5	+ 3. 6153559E+03	+ 3. 1456883E+02	+ 4. 1770000E+03	+ 3. 3380000E+03	+ 4. 7719335E+03
247.0	9	+ 5. 5610000E+03	+ 5. 1575261E+02	+ 7. 5360000E+03	+ 4. 1910000E+03	+ 5. 2631210E+03
254.0	10	+ 4. 3625976E+03	+ 5. 6815695E+02	+ 5. 8490000E+03	+ 3. 8310000E+03	+ 5. 5496484E+03
260.0	2	+ 5. 3765900E+03	+ 3. 0191058E+01	+ 5. 3980000E+03	+ 5. 3550000E+03	+ 5. 7952421E+03
266.0	8	+ 7. 5236250E+03	+ 4. 6150419E+02	+ 8. 3280000E+03	+ 6. 8640000E+03	+ 6. 0406399E+03

STAGE 1, DISCTED MCTCR=0012029, TRIAXIAL CHS=20.0 IN/MIN, 800 PSI, MODULUS

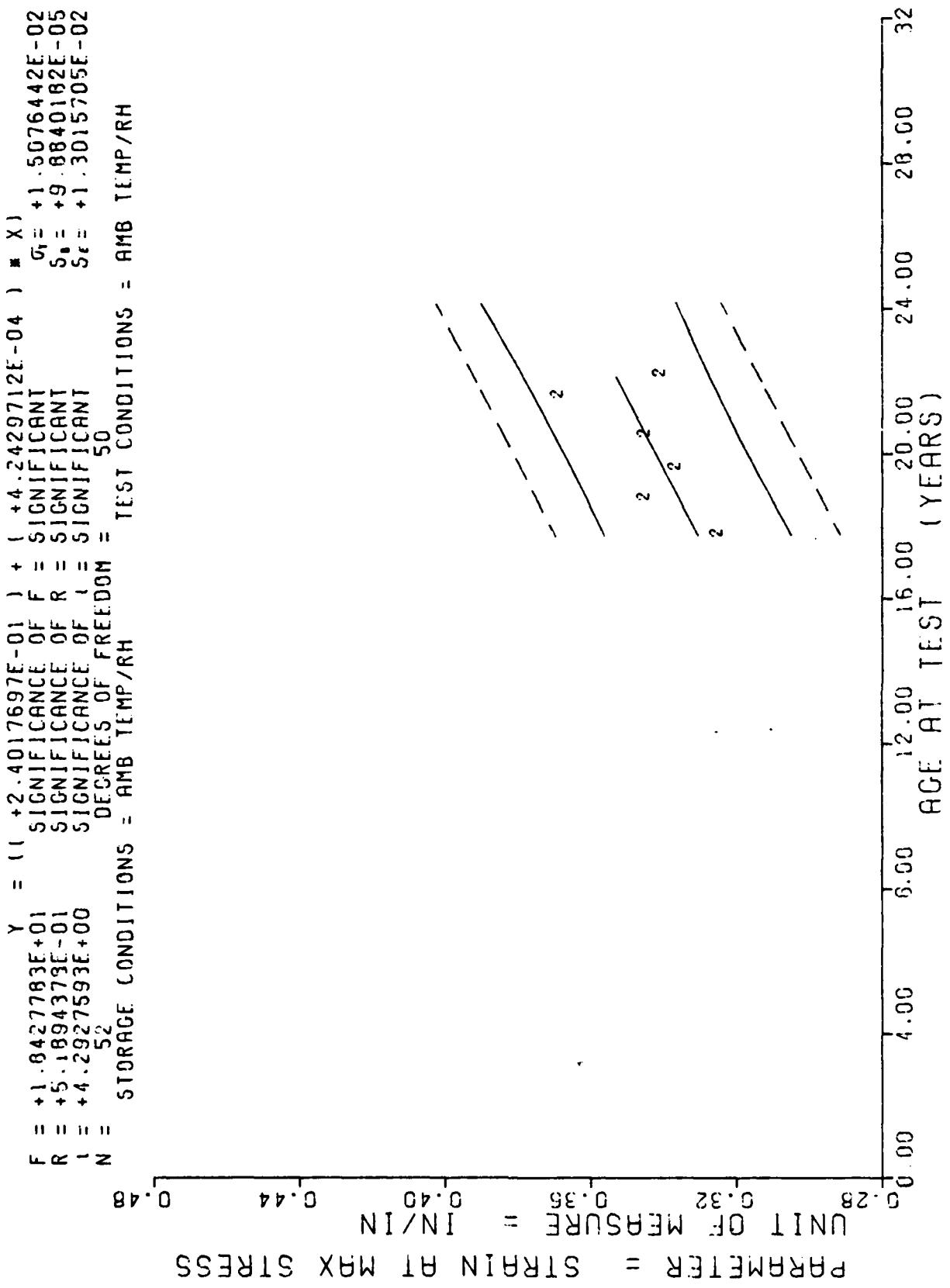


Figure 76

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	8	+3.2395576E-01	+4.7565514E-03	+3.2799594E-01	+3.1599598E-01	+3.3055222E-01
225.0	9	+3.440E855E-01	+5.830574E-03	+3.6189597E-01	+3.2759954E-01	+3.3564382E-01
235.0	9	+2.2555513E-01	+5.7457414E-03	+3.4495556E-01	+3.1399995E-01	+3.2988678E-01
246.0	9	+3.438E846E-01	+8.6541325E-03	+3.5695959E-01	+3.3299994E-01	+3.4455406E-01
259.0	8	+3.6774569E-01	+6.7582872E-03	+3.7895594E-01	+3.4999596E-01	+3.5006988E-01
266.0	9	+3.3965550E-01	+6.9041173E-03	+3.5295598E-01	+3.3099997E-01	+3.5303997E-01

STAGE 1, DISCTEC MCTCR=0012029, TRIAXIAL CHS=20.0 IN/MIN, 600 PSI, STRAIN MAX STRS.

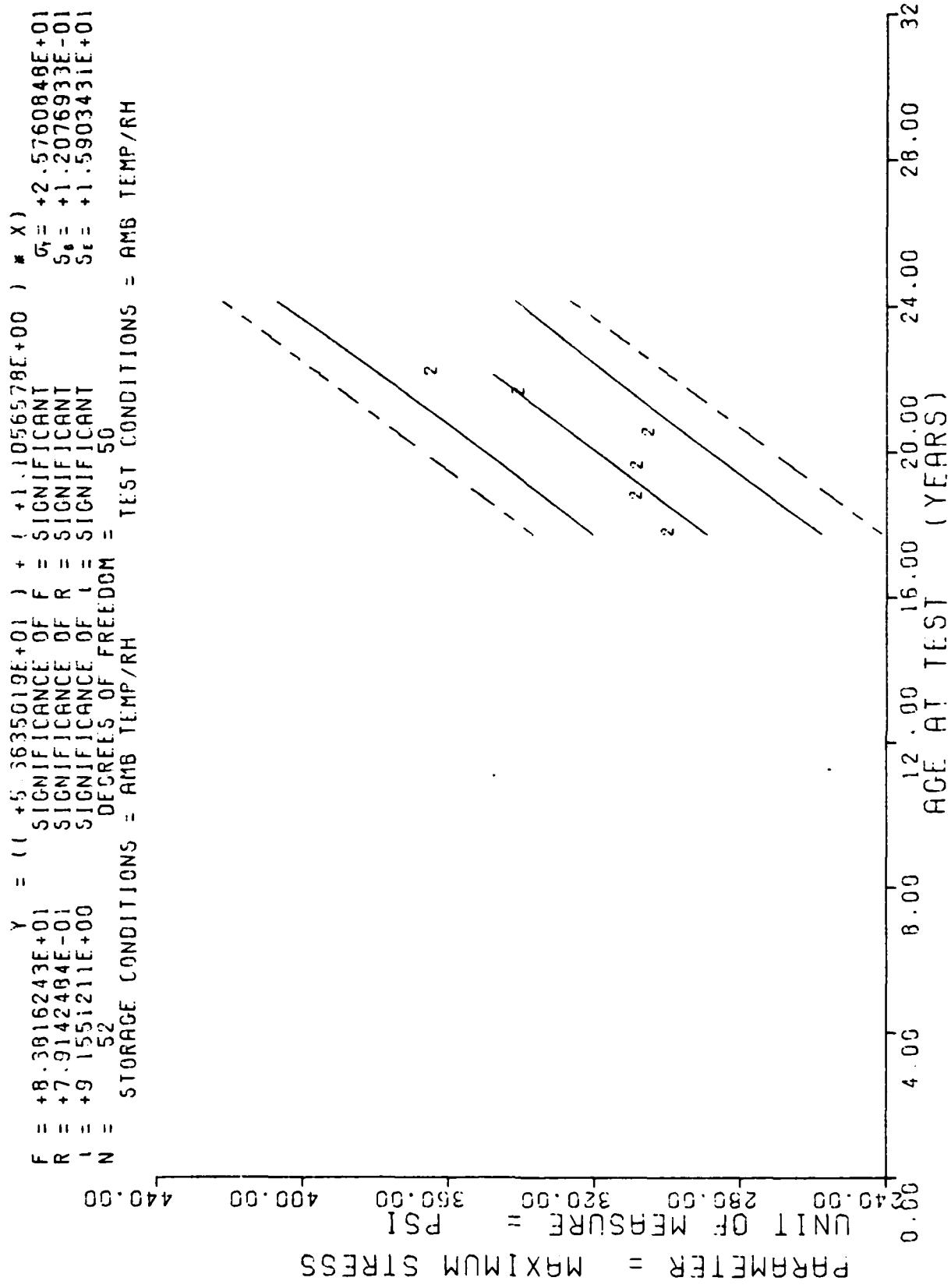


Figure 77

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

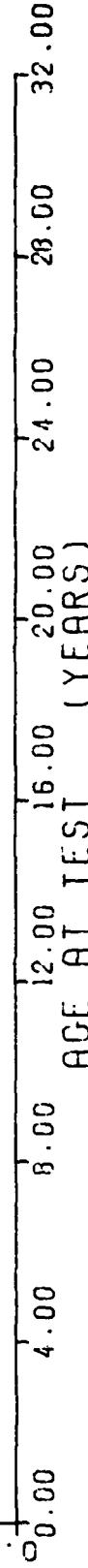
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
214.0	8	+2.56E-3E57E+02	+7.1909276E+00	+3.1036587E+02	+2.85557983E+02	+2.8914013E+02
225.0	9	+3.0715649E+02	+5.5594039E+00	+3.1232583E+02	+2.9914990E+02	+3.0240795E+02
235.0	9	+3.0706103E+02	+3.5750E46E+00	+3.1427578E+02	+3.0319995E+02	+3.1346459E+02
246.0	9	+3.0367E24E+02	+1.4414454E+01	+3.2550000E+02	+2.8900000E+02	+3.2562670E+02
259.0	6	+3.3936718E+02	+1.2383450E+01	+3.5975580E+02	+3.2788989E+02	+3.40000024E+02
266.0	9	+3.633E424E+02	+1.3534696E+01	+3.64E1982E+02	+3.4432983E+02	+3.4773999E+02

STAGE 1, DISCTEC MCTCR=0012029, TRIAXIAL CHS=20.0 IN/MIN, 800 PSI, MAX STRS.

$F = +3.4888031E+00$        $Y = (1 + 3.2919831E-01)$        $+ 1.8640110E-04$        $* X$   
 $R = +2.5539170E-01$       SIGNIFICANCE OF  $F$  = NOT SIGNIFICANT  
 $S = +1.8678338E+00$       SIGNIFICANCE OF  $R$  = NOT SIGNIFICANT  
 $N = 52$       SIGNIFICANCE OF  $S$  = NOT SIGNIFICANT  
 $S^2$       DEGREES OF FREEDOM = 50  
 $N$       STORAGE CONDITIONS = AMB TEMP/RH

TEST CONDITIONS = AMB TEMP/RH

PARAMETER = STRAIN AT RUPTURE  
 UNIT OF MEASURE = IN/IN  
 0.32      0.36      0.40      0.44      0.48      0.52



STAGE 1, DISCTED MOTOR=0012029, TRIAXIAL CH5=20.0 IN/MIN, 800 PSI, STRAIN AT RUPT.

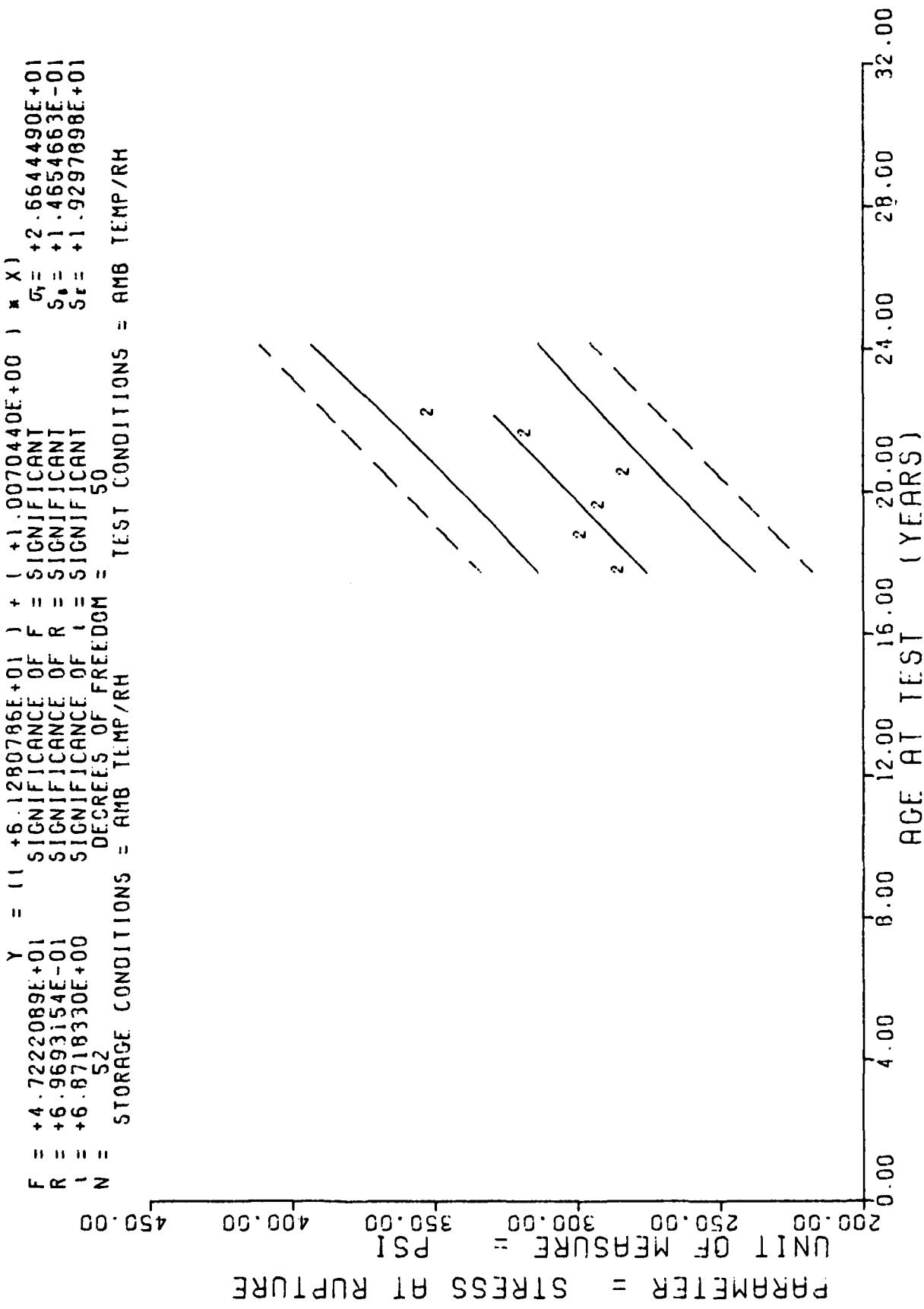
Figure 78

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	8	+3.8762474E-01	+9.1086858E-03	+4.0399598E-01	+3.7699957E-01	+3.9020174E-01
225.0	9	+3.885569E-01	+1.3250328E-02	+4.2299597E-01	+3.8099998E-01	+3.9363855E-01
235.0	9	+3.8833308E-01	+1.0720442E-02	+4.0399598E-01	+3.73999595E-01	+3.9650255E-01
246.0	9	+3.8677757E-01	+9.9233129E-03	+4.0999596E-01	+3.7899954E-01	+3.9965295E-01
259.0	8	+4.0149576E-01	+1.2559097E-02	+4.5659555E-01	+4.02099994E-01	+4.0337616E-01
266.0	9	+3.8302177E-01	+9.9319172E-03	+3.9349597E-01	+3.6179955E-01	+4.0518096E-01

STAGE 1, DISCTED MCTCR=0012029, TRIAXIAL CHS=20.0 IN/MIN, 800 PSI, STRAIN AT RUPT.



STAGE 1. DISC T'D MOTOR=0012029. TRIAXIAL. CHS=20.0 IN/MIN. 800 PSI. STRESS AT RUPT.

Figure 79

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	8	+2.8413720E+02	+6.7900737E+00	+2.9589590E+02	+2.7550000E+02	+2.7578100E+02
225.0	9	+2.9730761E+02	+7.0911390E+00	+3.0459585E+02	+2.8279980E+02	+2.8786547E+02
235.0	9	+2.9115527E+02	+4.0531653E+00	+2.9705585E+02	+2.8189590E+02	+2.9793603E+02
246.0	9	+2.8217651E+02	+1.3812803E+01	+3.0359585E+02	+2.6409985E+02	+3.0901342E+02
259.0	8	+3.1666235E+02	+1.2457985E+01	+3.4200000E+02	+3.0229900E+02	+3.2210498E+02
266.0	9	+3.5073574E+02	+1.6739990E+01	+3.7664550E+02	+3.3271997E+02	+3.2915429E+02

STAGE 1, DISCTED MCTOR=0012029, TRIAXIAL CHS=20.0 IN/MIN, 600 PSI, STRESS AT RUPT.

$F = +1.8962538E+01$        $Y = (( +5.3867823E+02 ) + ( +4.0860533E+00 ) * X)$   
 $R = +5.2437456E-01$       SIGNIFICANCE OF F = SIGNIFICANT  
 $I = +4.3545997E+00$       SIGNIFICANCE OF R = SIGNIFICANT  
 $N = 52$       SIGNIFICANCE OF I = SIGNIFICANT  
DEGREES OF FREEDOM = 50  
STORAGE CONDITIONS = AMB TEMP/RH

UNIT OF MEASURE = PSI      \*10<sup>-2</sup>  
PARAMETER = MODULUS

STAGE 1, DISC TLD MOTOR=0012029, TRIAXIAL CHS=20.0 IN/MIN, 800 PSI, MODULUS

Figure 80

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	8	+1.495E250E+03	+6.347E764E+01	+1.5700000E+03	+1.3900000E+03	+1.40900075E+03
225.0	9	+1.4477775E+03	+9.4593575E+01	+1.5940000E+03	+1.3290000E+03	+1.4580400E+03
235.0	9	+1.4257775E+03	+7.4672246E+01	+1.5290000E+03	+1.3480000E+03	+1.4989006E+03
246.0	9	+1.4502221E+03	+8.7478251E+01	+1.6850000E+03	+1.4140000E+03	+1.5438471E+03
259.0	8	+1.495E250E+03	+1.2896891E+02	+1.6270000E+03	+1.2760000E+03	+1.5969658E+03
266.0	9	+1.765E65E+03	+6.6440008E+01	+1.9240000E+03	+1.6730000E+03	+1.6255683E+03

STAGE 1,DISCTED MCTCR=0012029,1RIAXIAL CHS=20.0 IN/MIN,800 PSI,MODULUS

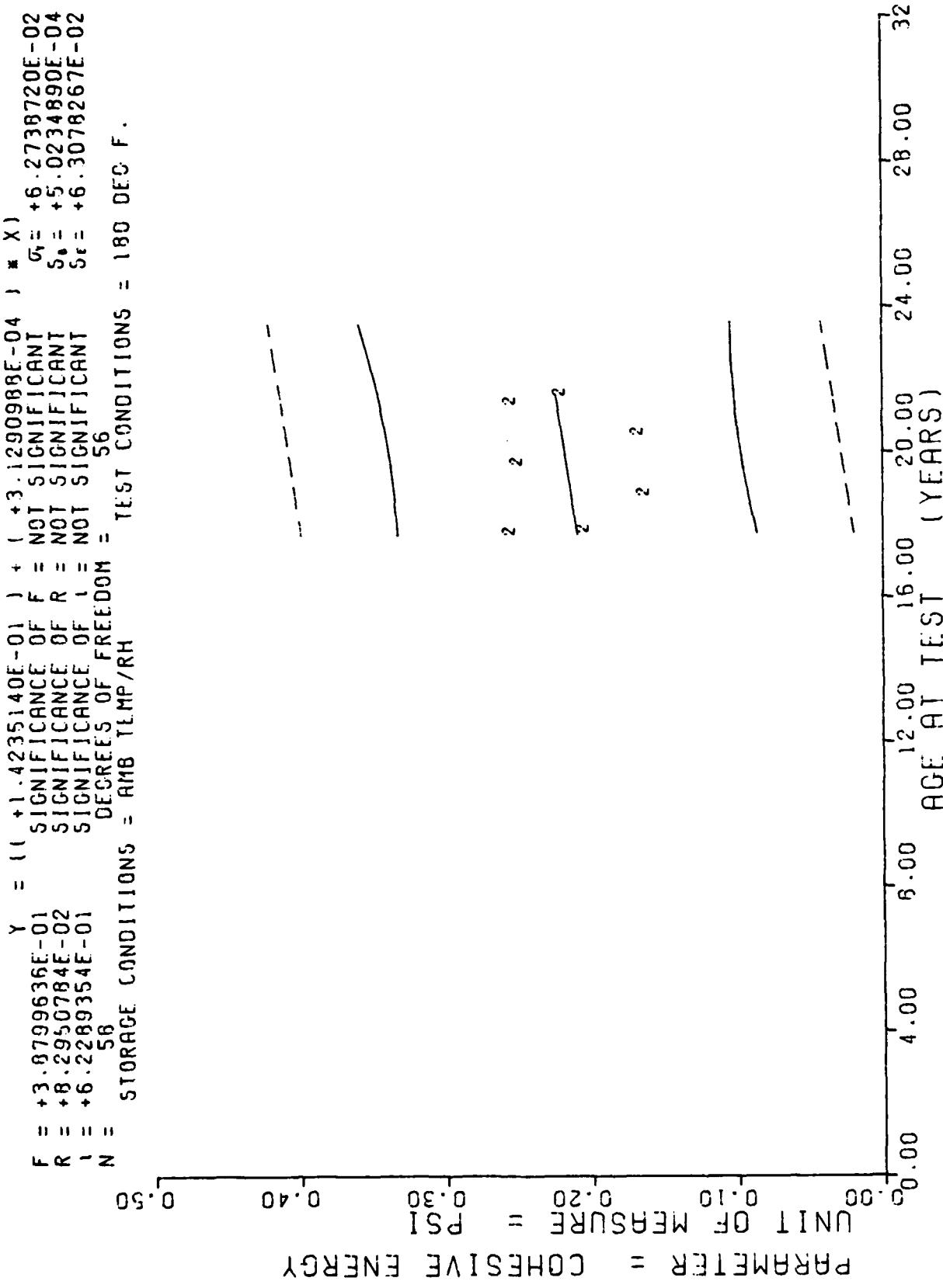


Figure 81

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	8	+2.5204956E-01	+8.5341140E-02	+4.1389555E-01	+1.20899957E-01	+2.0900118E-01
214.0	2	+2.0185994E-01	+8.4838484E-03	+2.0789598E-01	+1.9589996E-01	+2.0931410E-01
226.0	5	+1.6018867E-01	+3.6216185E-02	+2.1689559E-01	+1.0489694E-01	+2.1306902E-01
236.0	8	+2.4691224E-01	+2.6275579E-02	+3.0399556E-01	+2.0259554E-01	+2.1619808E-01
246.0	9	+1.6435574E-01	+5.2346823E-02	+2.7249557E-01	+9.4299972E-02	+2.1932721E-01
256.0	15	+2.5147300E-01	+3.6848134E-02	+3.3089595E-01	+1.9029998E-01	+2.2245627E-01
259.0	7	+2.1764260E-01	+6.716742E-02	+3.2689554E-01	+1.2089957E-01	+2.2339504E-01

STAGE 1. DISSECTED MOTCR=0012029, TEAR ENERGY, CHS=.0021N/MIN, T/TEMP=180DEG.

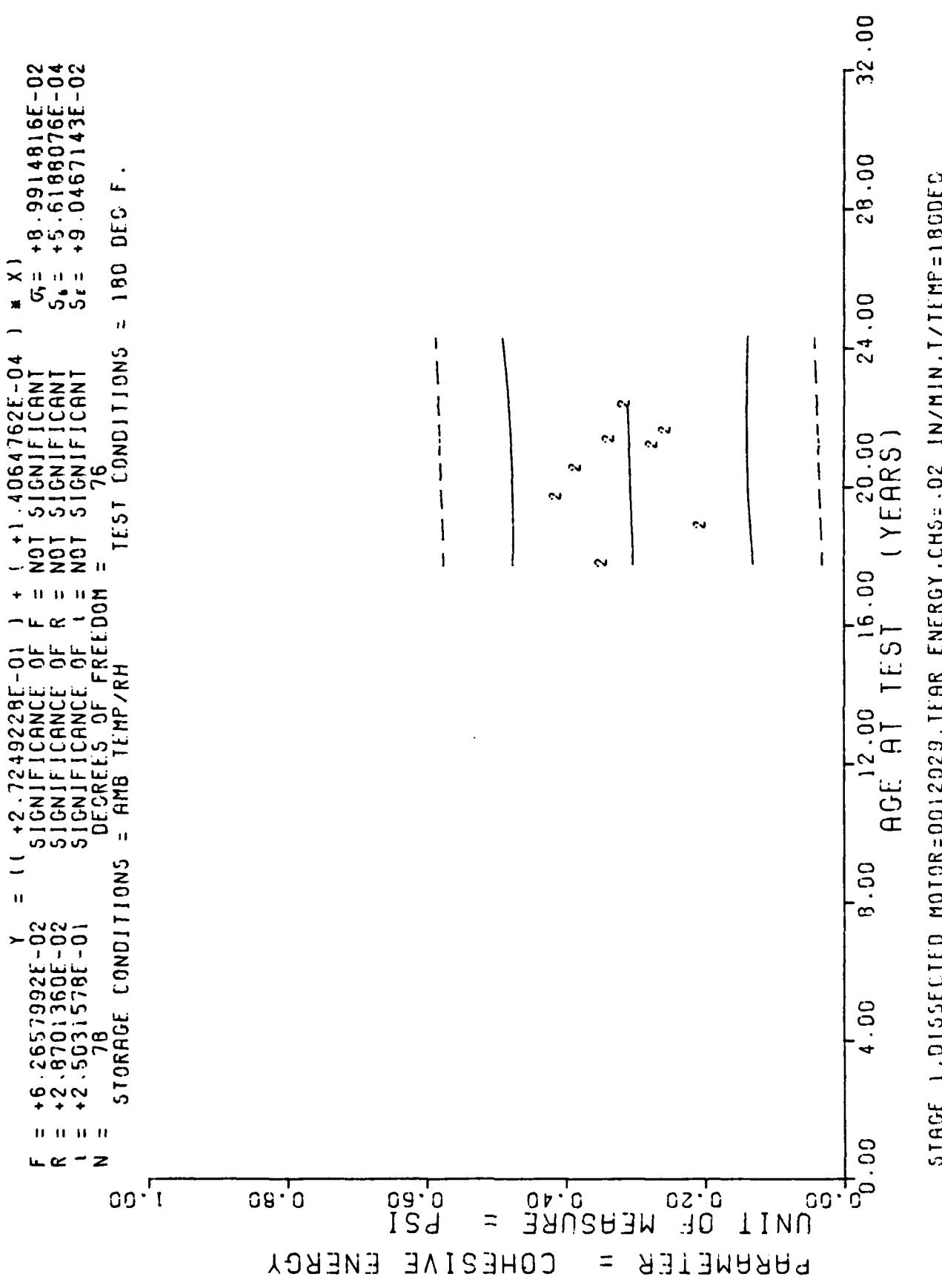


Figure 82

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

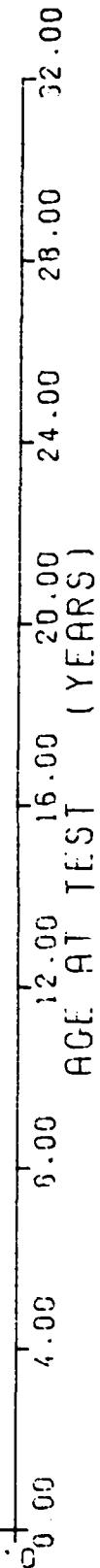
\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION Y	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+2.4031069E-01	+4.5805569E-02	+4.2485559E-01	+2.7719999E-01	+3.0245018E-01
226.0	12	+1.9535780E-01	+4.0602338E-02	+2.5289594E-01	+1.2589957E-01	+3.0427861E-01
236.0	9	+4.055622E-01	+3.5020549E-02	+4.7505598E-01	+3.5689957E-01	+3.0568510E-01
246.0	8	+3.781E706E-01	+1.0434053E-01	+5.2879595E-01	+2.3499955E-01	+3.0709159E-01
254.0	15	+2.666638E-01	+7.0862139E-02	+3.6555559E-01	+1.0199595E-01	+3.0821675E-01
256.0	6	+2.3044558E-01	+5.0453247E-02	+4.1899556E-01	+2.8809994E-01	+3.0849802E-01
259.0	1	+2.5000000E-01	+0.0000000E+07	+2.5000000E-01	+2.5000000E-01	+3.0891996E-01
268.0	18	+3.0637738E-01	+8.1246552E-02	+4.6459557E-01	+1.7539995E-01	+3.1018579E-01

STAGE 1, DISSECTED MOTOR=0012029, TEAR ENERGY, CHS=.62 IN/MIN.T/TEMP=180DEG.

$F = +1.2759072E+01$        $Y = (( -2.5202009E-01 ) + ( +6.1856594E-03 ) * X)$   
 $R = +4.1312131E-01$       SIGNIFICANT OF F = SIGNIFICANT  
 $I = +3.5719844E+00$       SIGNIFICANT OF R = SIGNIFICANT  
 $N = 64$       SIGNIFICANT OF I = SIGNIFICANT  
DEGREES OF FREEDOM = 62      TEST CONDITIONS = AMB TEMP/RH

$PARMETER = COHESIVE ENERGY$   
UNIT OF MEASURE = PSI



STAGE 1. DISSECTED MOTOR=0012029. TEAR ENERGY, CHS=0.2 IN/MIN, T/TEMP=77 DEG.

Figure 83

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+1.2066657E+00	+1.4121932E-01	+1.4705557E+00	+9.6389957E-01	+1.06555670E+00
225.0	9	+1.0280103E+00	+1.6425261E-01	+1.2229595E+00	+7.6189994E-01	+1.1397981E+00
236.0	5	+9.5341062E-01	+1.1360751E-01	+1.1695591E+00	+7.9689997E-01	+1.2078419E+00
246.0	10	+1.2612586E+00	+2.0797104E-01	+1.7178553E+00	+1.1148956E+00	+1.2697010E+00
254.0	15	+1.4456033E+00	+1.8234639E-01	+1.7614554E+00	+1.1972999E+00	+1.3191881E+00
268.0	12	+1.3402328E+00	+3.4327530E-01	+2.3051556E+00	+1.00028991E+00	+1.4057893E+00

STAGE 1. DISSECTED MOTOR=0012029. TEAR ENERGY. CHS=0.2 IN/MIN. T/TEMP=77 DEG.

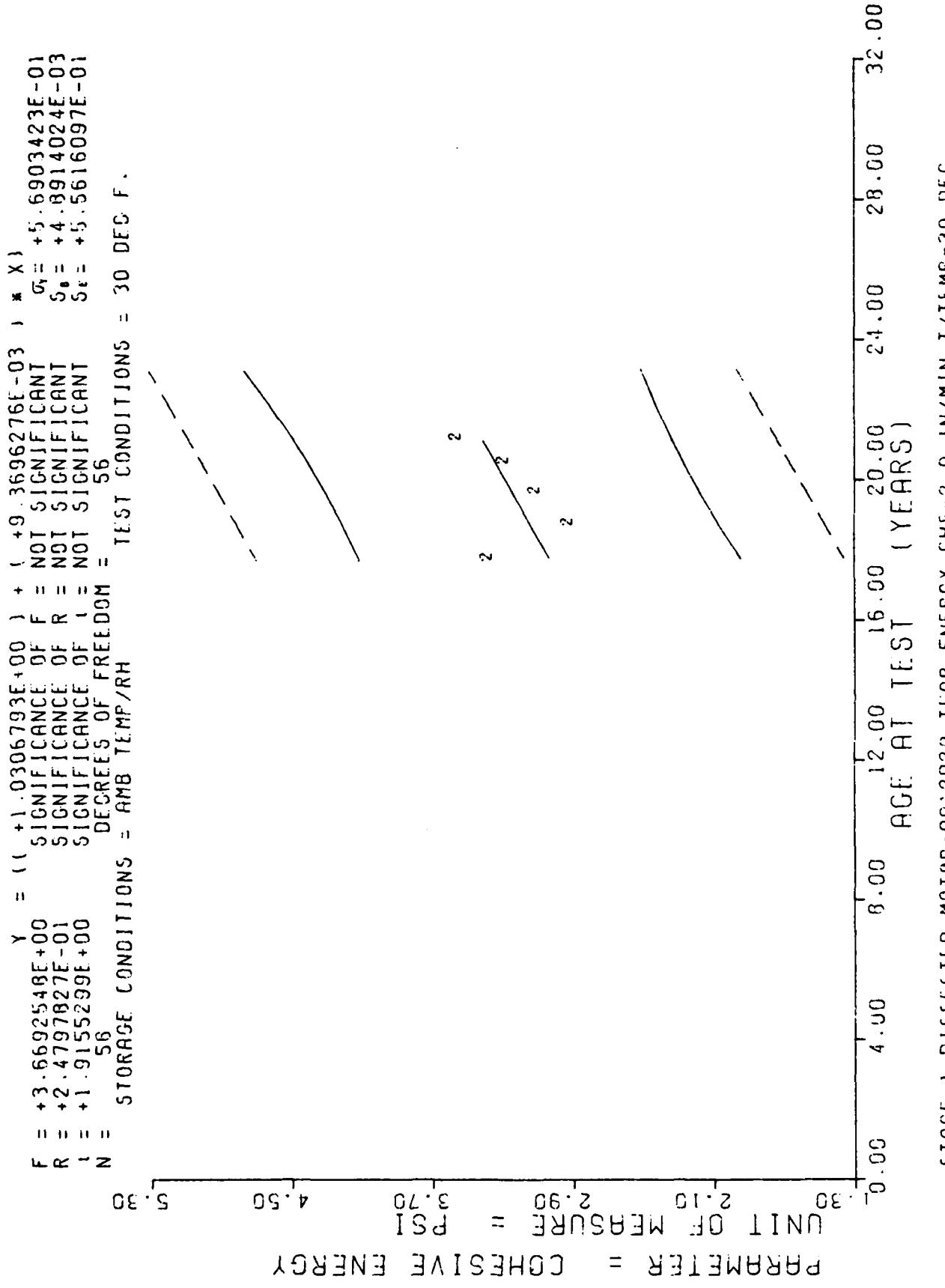
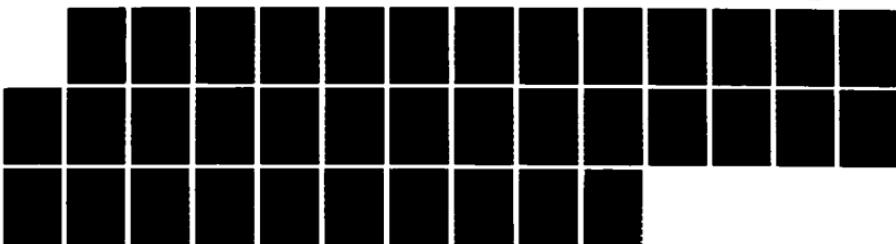
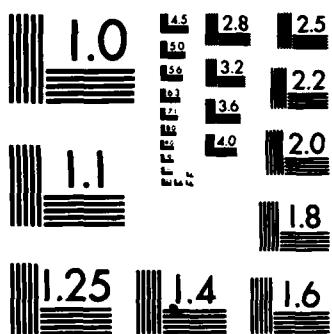


Figure 84

AD-A171 132 SURVEILLANCE REPORT STAGE I DISSECTED MOTOR/PROPELLANT 3/3  
MOTOR NUMBER 0012029(U) OGDEN AIR LOGISTICS CENTER HILL  
AFB UT PROPELLANT ANALYSIS LAB J A THOMPSON FEB 86  
UNCLASSIFIED MAQCP-515(86) F/G 21/8.2 NL





MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+3.3592624E+00	+3.0650620E-01	+3.5605554E+00	+2.9319992E+00	+3.0264091E+00
225.0	14	+2.9025449E+00	+4.5835577E-01	+4.0307598E+00	+2.3626997E+00	+3.1388454E+00
236.0	8	+3.0920372E+00	+4.0826249E-01	+3.5736559E+00	+2.5707958E+00	+3.2419109E+00
246.0	10	+3.2692756E+00	+4.7052791E-01	+3.8438557E+00	+2.4749954E+00	+3.3356075E+00
254.0	17	+3.65384817E+00	+7.2448510E-01	+5.35888551E+00	+2.4639556E+00	+3.4105644E+00

STAGE 1. DISSECTED MOTCR=0012029. TEAR ENERGY, CHS=2.0 IN/MIN, T/TEMP=30 DEG.

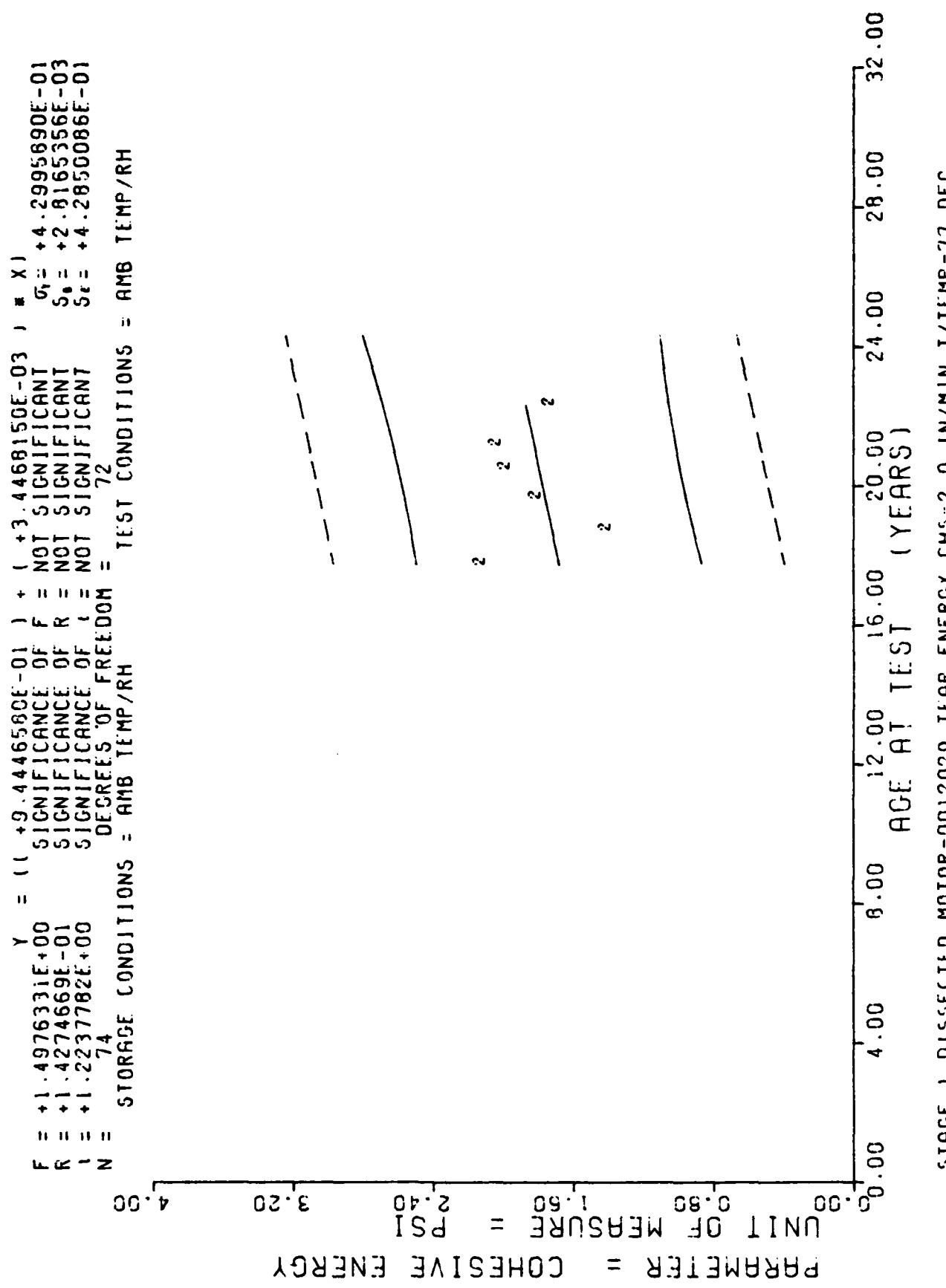


Figure 85

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+2.1049308E+00	+3.01197642E-01	+2.5698555E+00	+1.7658556E+00	+1.6786365E+00
225.0	21	+1.3516749E+00	+3.05750382E-01	+2.3799551E+00	+9.5789998E-01	+1.7199983E+00
236.0	9	+1.7857758E+00	+3.4817790E-01	+2.3349550E+00	+1.3633995E+00	+1.7579135E+00
246.0	10	+1.5629974E+00	+3.7146748E-01	+2.0465555E+00	+1.5579996E+00	+1.7923922E+00
254.0	14	+2.0176172E+00	+3.7682541E-01	+2.5305551E+00	+1.3147993E+00	+1.8199567E+00
268.0	11	+1.7134618E+00	+2.5451050E-01	+2.3148594E+00	+1.2419956E+00	+1.8682117E+00

STAGE 1. CISSECTEC MOTOR=0012029, TEAR ENERGY, CHS=2.0 IN/MIN.T/TEMP=77 DEG.

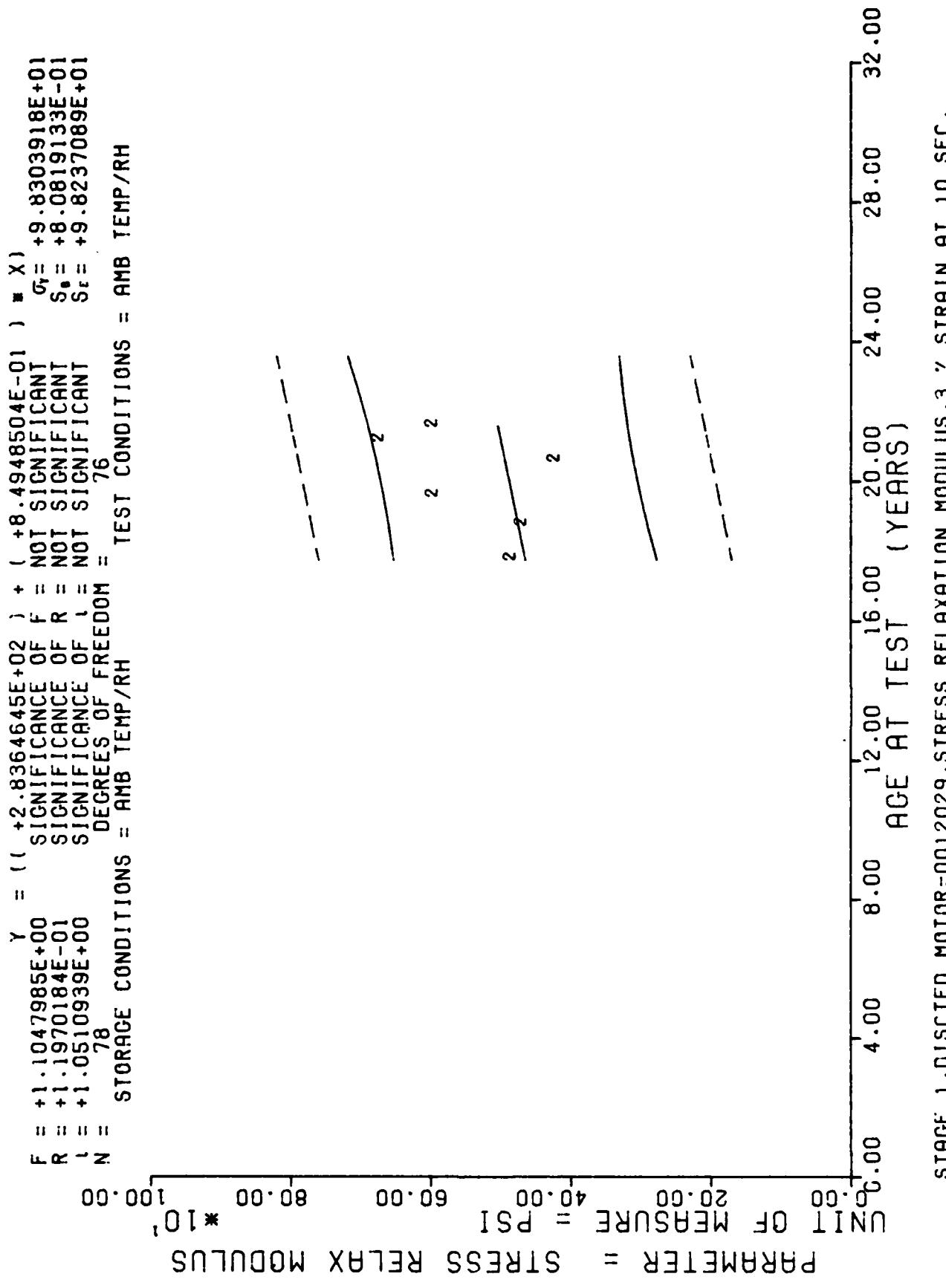


Figure 86

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+4.7955541E+02	+4.2473848E+01	+5.7000000E+02	+4.2300000E+02	+4.6458666E+02
225.0	9	+4.6422216E+02	+2.6152331E+01	+5.0300000E+02	+4.3300000E+02	+4.7478051E+02
235.0	10	+5.5065595E+02	+6.1786460E+01	+6.4000000E+02	+4.4300000E+02	+4.8327539E+02
247.0	36	+4.1716650E+02	+3.3706718E+01	+4.8700000E+02	+3.5700000E+02	+4.9346923E+02
254.0	5	+6.6800000E+02	+1.1890962E+02	+7.6300000E+02	+5.1000000E+02	+4.9941552E+02
259.0	9	+5.9144433E+02	+7.3642907E+01	+6.9700000E+02	+4.7000000E+02	+5.0366284E+02

STAGE 1. DISCTED MATOR=0012029. STRESS RELAXATION MODULUS,3 X STRAIN AT 10 SEC.

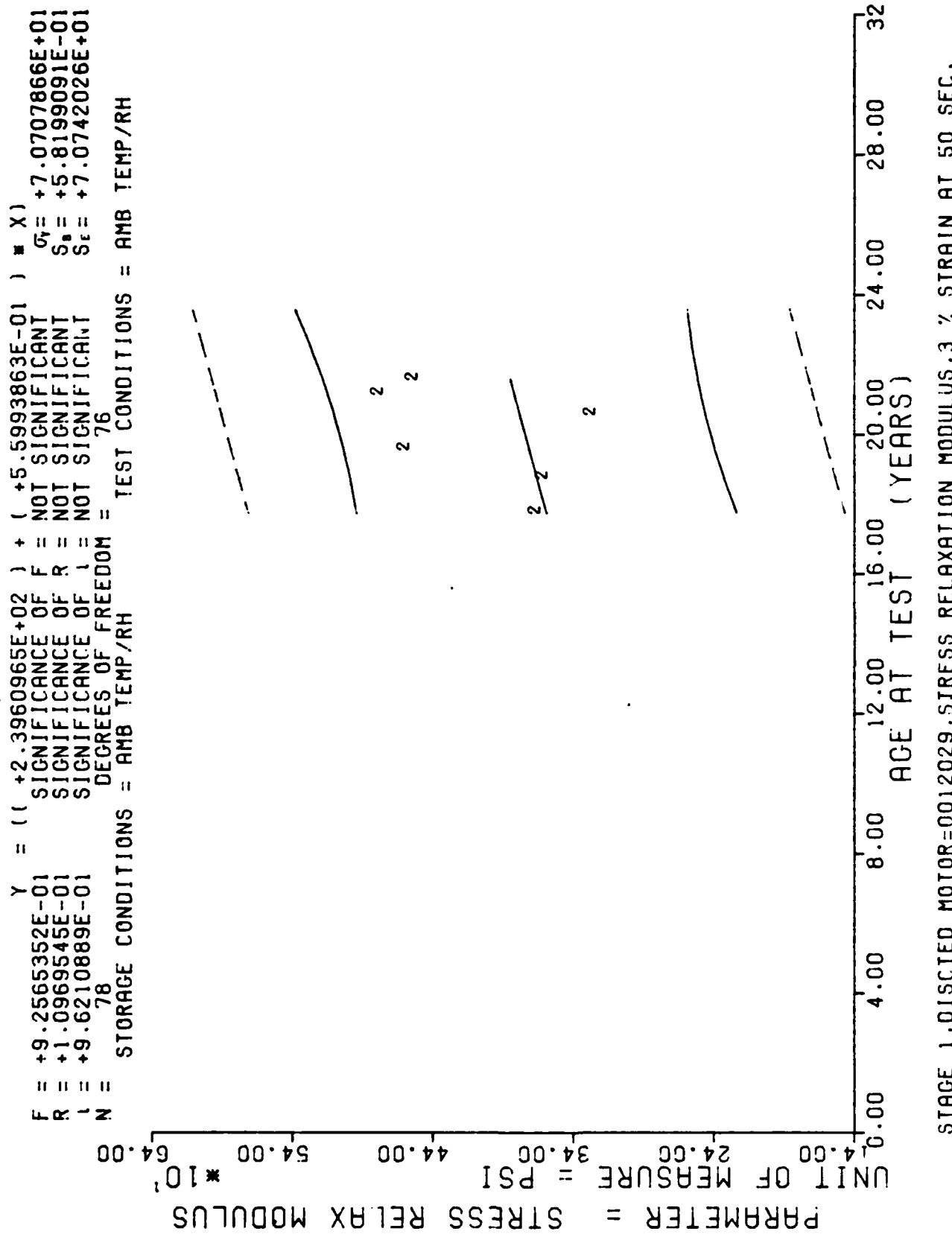


Figure 87

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+3.6388867E+02	+2.8997605E+01	+4.2700000E+02	+3.2700000E+02	+3.5887646E+02
225.0	9	+3.5677758E+02	+2.2331467E+01	+4.0000000E+02	+3.3300000E+02	+3.6559570E+02
235.0	10	+4.5709985E+02	+5.0533707E+01	+5.0000000E+02	+3.4000000E+02	+3.7119506E+02
247.0	36	+3.2477758E+02	+3.1472537E+01	+3.9700000E+02	+2.7000000E+02	+3.7791430E+02
254.0	5	+4.7575580E+02	+7.9590828E+01	+5.3300000E+02	+3.7000000E+02	+3.8183398E+02
259.0	9	+4.5133325E+02	+5.7397735E+01	+5.3300000E+02	+3.5700000E+02	+3.8463354E+02

STAGE 1. DISCTED MATOR=0012029, STRESS RELAXATION MODULUS,3 X STRAIN AT 50 SEC.

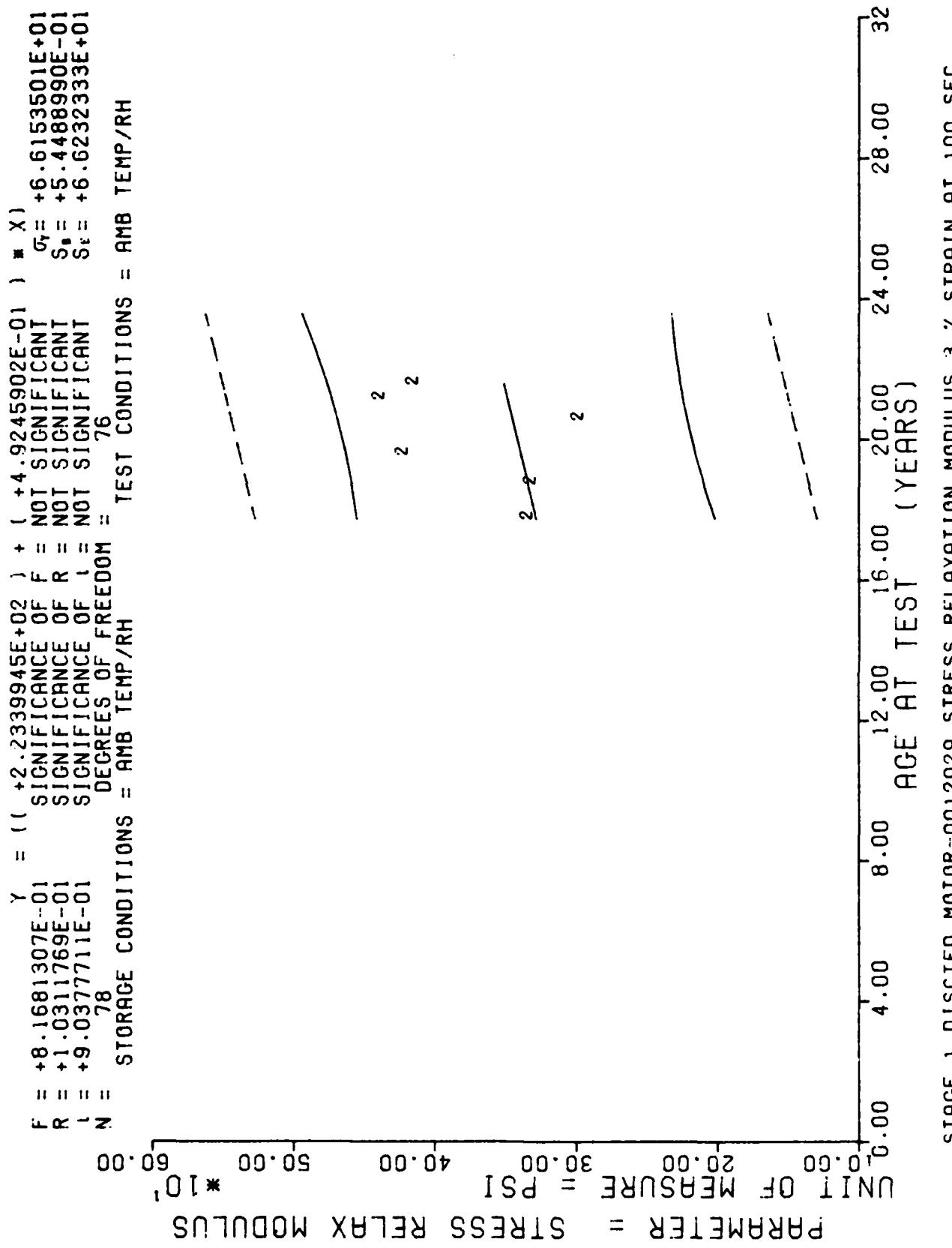


Figure 88

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+3.3144433E+02	+2.4556623E+01	+3.8300000E+02	+2.9700000E+02	+3.2829321E+02
225.0	9	+3.293325E+02	+2.0706279E+01	+3.700000E+02	+3.0700000E+02	+3.3420263E+02
235.0	10	+4.1575580E+02	+4.7994907E+01	+4.6000000E+02	+3.0700000E+02	+3.3912719E+02
247.0	36	+2.9568325E+02	+3.0893711E+01	+3.7300000E+02	+2.4300000E+02	+3.4503662E+02
254.0	5	+4.3600000E+02	+7.3375745E+01	+4.9700000E+02	+3.4300000E+02	+3.4848388E+02
259.0	9	+4.1222216E+02	+5.4714663E+01	+4.8700000E+02	+3.2300000E+02	+3.5094628E+02

STAGE 1. DISCTED MCTOR=0012029, STRESS RELAXATION MODULUS.3 % STRAIN AT 100 SEC.

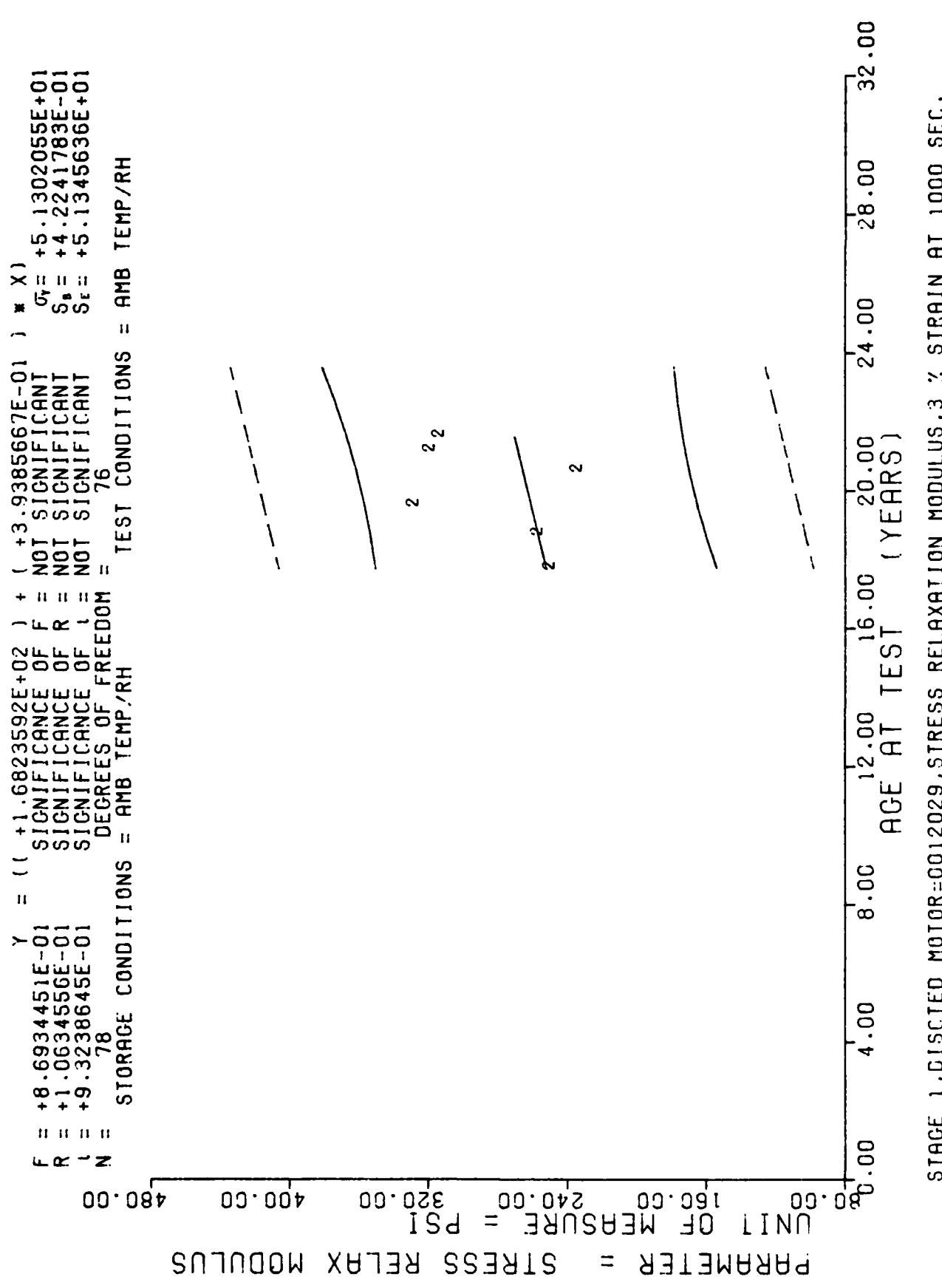


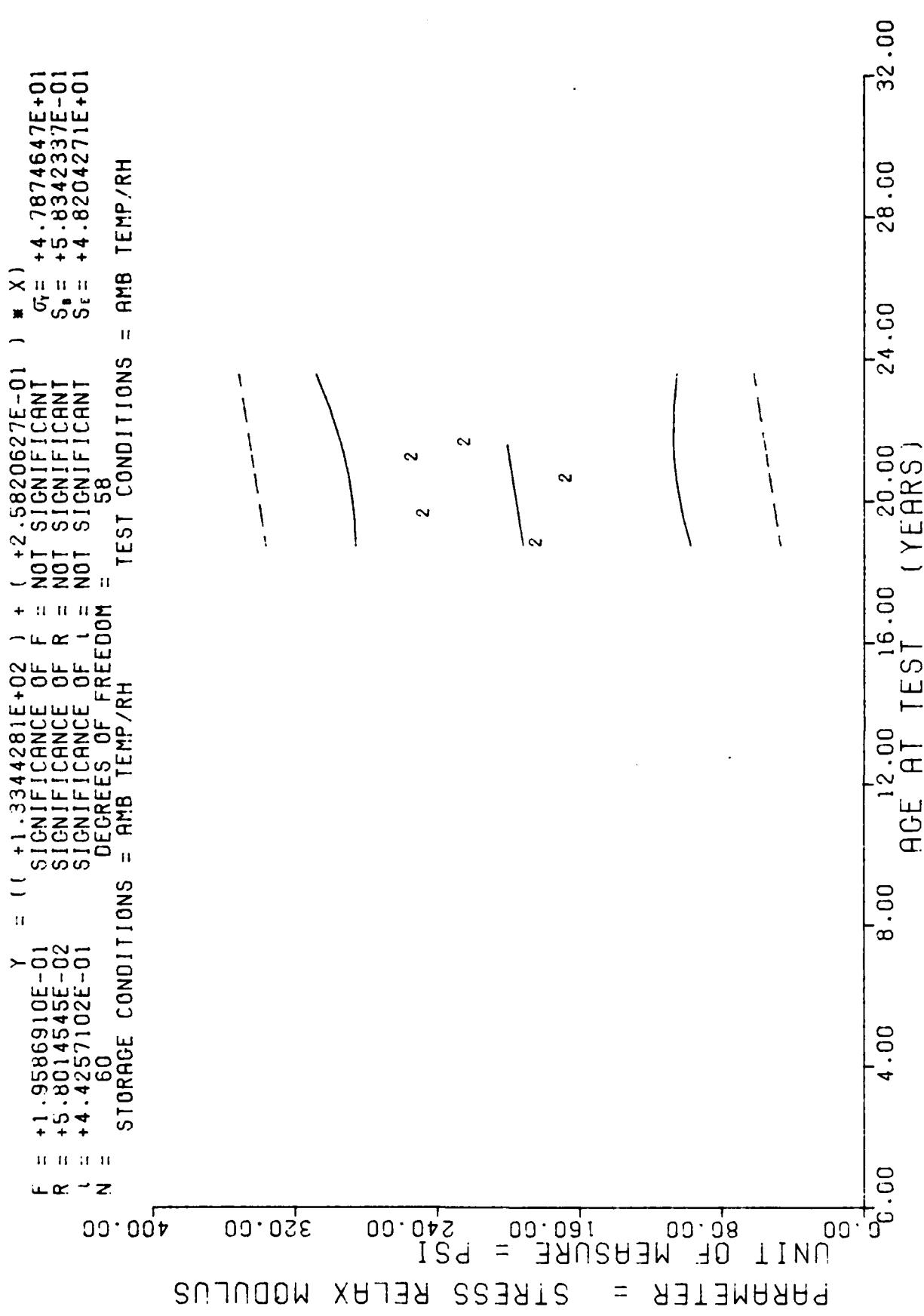
Figure 89

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+2.478888E+02	+1.5584001E+01	+2.7700000E+02	+2.2700000E+02	+2.5212739E+02
225.0	9	+2.547777E+02	+1.7809953E+01	+2.9300000E+02	+2.3300000E+02	+2.5685351E+02
235.0	10	+3.2600000E+02	+3.9149286E+01	+3.5700000E+02	+2.3700000E+02	+2.6079223E+02
247.0	36	+2.3202777E+02	+3.5238360E+01	+3.3000000E+02	+1.8300000E+02	+2.6551831E+02
254.0	5	+3.165585E+02	+5.2276189E+01	+3.6000000E+02	+2.5000000E+02	+2.6827539E+02
259.0	9	+3.1122216E+02	+4.7182565E+01	+3.6700000E+02	+2.3700000E+02	+2.7024462E+02

STAGE 1. DISCTED MCTOR=00112029, STRESS RELAXATION MODULUS,3 X STRAIN AT 1000 SEC.



STAGE 1, DISCTED MOTOR=0012029, STRESS RELAXATION MODULUS, 3% STRAIN AT 10000 SEC.

Figure 90

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
225.0	9	+1.8166665E+02	+2.4181604E+01	+2.3300000E+02	+1.5300000E+02	+1.9153921E+02
235.0	10	+2.4489999E+02	+2.6876052E+01	+2.7700000E+02	+1.8700000E+02	+1.9412129E+02
247.0	27	+1.6488888E+02	+3.2989897E+01	+2.2700000E+02	+1.0700000E+02	+1.9721975E+02
254.0	5	+2.5135999E+02	+4.5812662E+01	+2.9700000E+02	+1.9300000E+02	+1.9902720E+02
259.0	9	+2.2166665E+02	+4.2130748E+01	+2.6300000E+02	+1.6300000E+02	+2.0031823E+02

STAGE 1. DISCTED MCTOR=0012029. STRESS RELAXATION MODULUS,3X STRAIN AT 10000 SEC.

$F = +9.5775915E+00$        $Y = 11(-6.4406055E+01) + ( +1.2982815E+00) * X$   
 $R = +3.3651195E-01$       SIGNIFICANCE OF  $F$  = SIGNIFICANT  
 $S = +3.3651195E-01$       SIGNIFICANCE OF  $R$  = SIGNIFICANT  
 $t = +3.0947684E+00$       SIGNIFICANCE OF  $t$  = SIGNIFICANT  
 $D = 77$       DEGREES OF FREEDOM = 75  
 $N = 77$       STORAGE CONDITIONS = AMB TEMP/RH      TEST CONDITIONS = 180 SEC F.

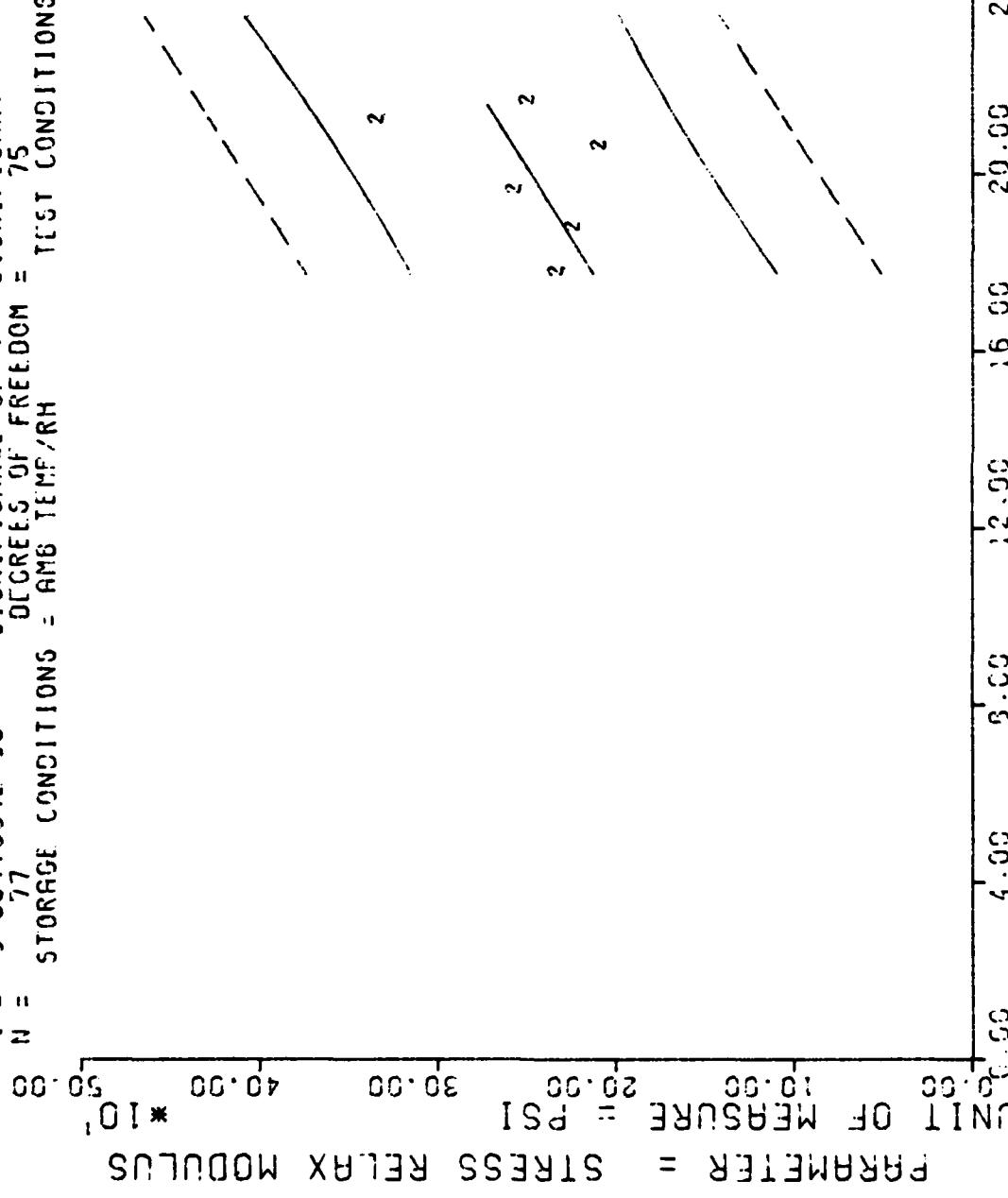


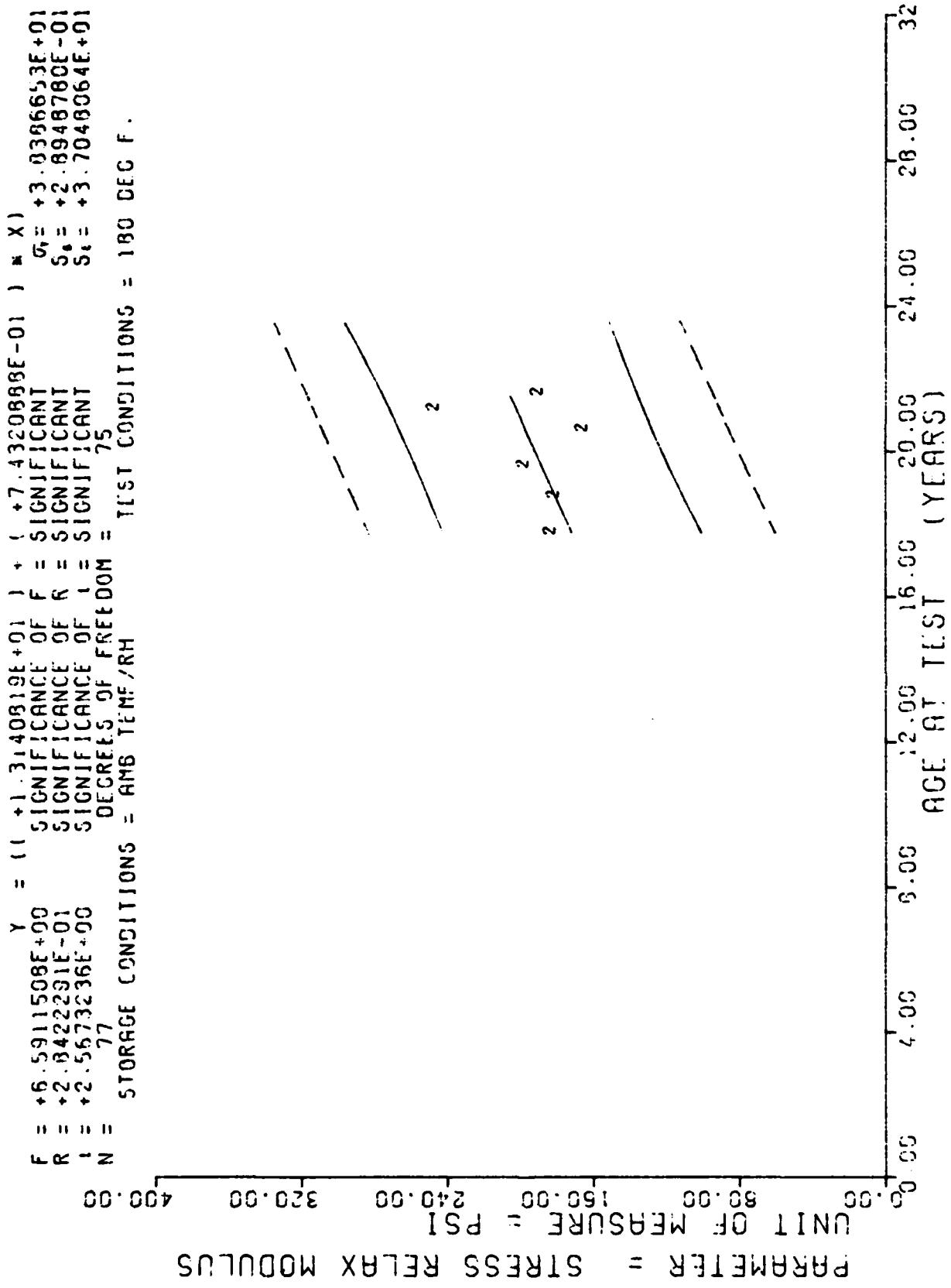
Figure 91

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIAION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+2.297777E+02	+1.0329300E+01	+2.4300000E+02	+2.1300000E+02	+2.1212789E+02
225.0	9	+2.207777E+02	+2.0308728E+01	+2.4300000E+02	+1.7700000E+02	+2.2770729E+02
235.0	9	+2.5366665E+02	+2.1511624E+01	+2.8700000E+02	+2.2300000E+02	+2.4069009E+02
247.0	23	+2.0604347E+02	+3.1110475E+01	+2.6300000E+02	+1.6700000E+02	+2.5626928E+02
254.0	18	+3.3061108E+02	+4.8429620E+01	+4.0100000E+02	+2.6700000E+02	+2.6535742E+02
259.0	9	+2.4696938E+02	+1.46969000E+01	+2.7700000E+02	+2.2700000E+02	+2.7184863E+02

STAGE 1,DISCTED MCTOR=0012029,STRESS RELAXATION MODULUS.3 X STRAIN AT 10 SEC.



STAGE 1, DISCTED MOTOR=03;2029, STRESS RELAXATION MODULUS, 3 % STRAIN AT 50 SEC

Figure 92

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+1.810000E+02	+5.1720402E+00	+1.870000E+02	+1.730000E+02	+1.7144430E+02
225.0	9	+1.7922221E+02	+1.5081261E+01	+2.0300000E+02	+1.5300000E+02	+1.8036260E+02
235.0	9	+1.955554E+02	+2.2130923E+01	+2.2700000E+02	+1.6300000E+02	+1.8779490E+02
247.0	23	+1.6352172E+02	+2.6345380E+01	+2.2000000E+02	+1.3000000E+02	+1.9671340E+02
254.0	18	+2.4500000E+02	+3.1415619E+01	+2.9700000E+02	+2.0700000E+02	+2.0191586E+02
259.0	9	+1.8811109E+02	+1.6019085E+01	+2.1700000E+02	+1.7000000E+02	+2.0563191E+02

STAGE 1, DISCTED MCTOR=0012029, STRESS RELAXATION MODULUS,3 X STRAIN AT 50 SEC.

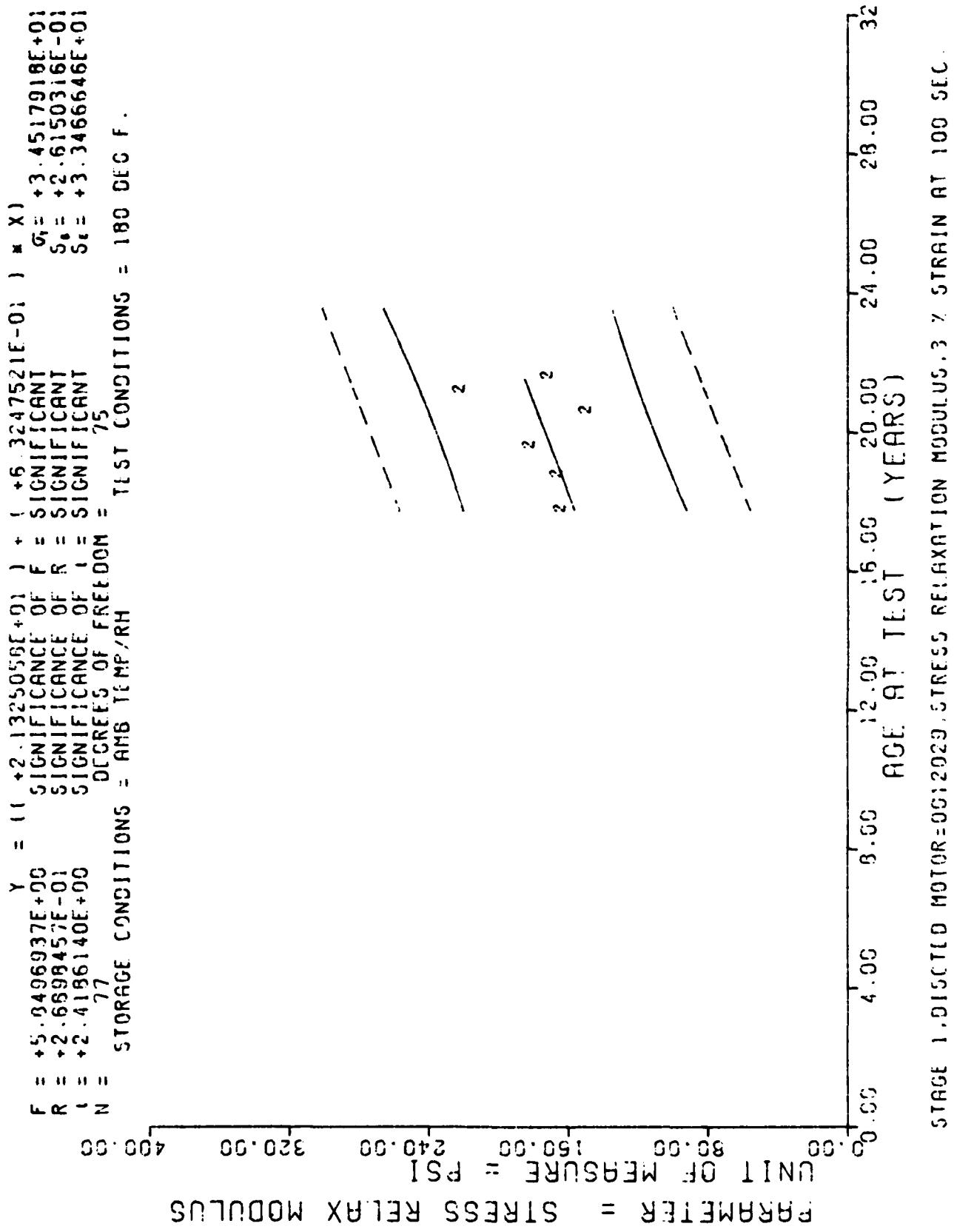


Figure 93

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+1.6211109E+02	+5.5465209E+00	+1.7000000E+02	+1.5300000E+02	+1.5604226E+02
225.0	9	+1.6433332E+02	+1.4645818E+01	+1.9000000E+02	+1.4300000E+02	+1.6363197E+02
235.0	9	+1.8000000E+02	+1.56672315E+01	+2.1000000E+02	+1.5000000E+02	+1.6995672E+02
247.0	23	+1.4747825E+02	+2.3836316E+01	+1.9700000E+02	+1.1700000E+02	+1.7754643E+02
254.0	18	+2.1577777E+02	+2.9312827E+01	+2.7000000E+02	+1.8300000E+02	+1.8197375E+02
259.0	9	+1.6955554E+02	+1.5216036E+01	+1.9700000E+02	+1.5300000E+02	+1.8513613E+02

STAGE 1. DISCTED MCTCR=0012029. STRESS RELAXATION MODULUS.3 X STRAIN AT 100 SEC.

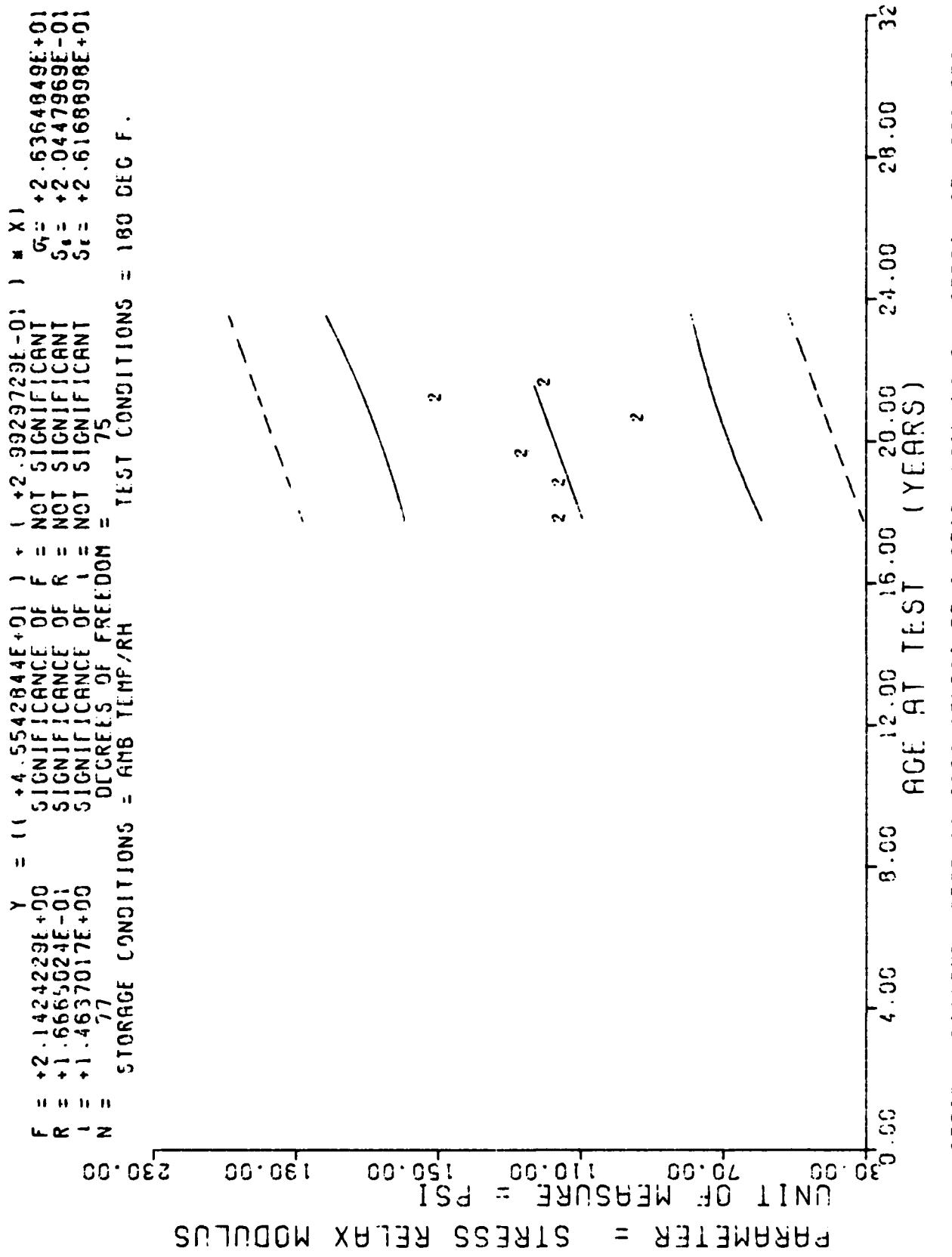


Figure 94

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+1.1477777E+02	+1.3600616E+01	+1.4000000E+02	+9.7000000E+01	+1.0929316E+02
225.0	9	+1.1477777E+02	+1.2346839E+01	+1.3700000E+02	+9.3000000E+01	+1.1288473E+02
235.0	9	+1.2522221E+02	+1.4228297E+01	+1.4000000E+02	+1.0700000E+02	+1.1587770E+02
247.0	23	+9.2739120E+01	+1.2512602E+01	+1.1700000E+02	+7.0000000E+01	+1.1946926E+02
254.0	18	+1.4944444E+02	+2.3717013E+01	+1.9700000E+02	+1.2000000E+02	+1.2156434E+02
259.0	9	+1.1666888E+02	+1.7186073E+01	+1.5300000E+02	+9.3000000E+01	+1.2306003E+02

STAGE 1,DISCTEC MCTOR=0012029,STRESS RELAXATION MODULUS,3 X STRAIN AT 1000 SEC.

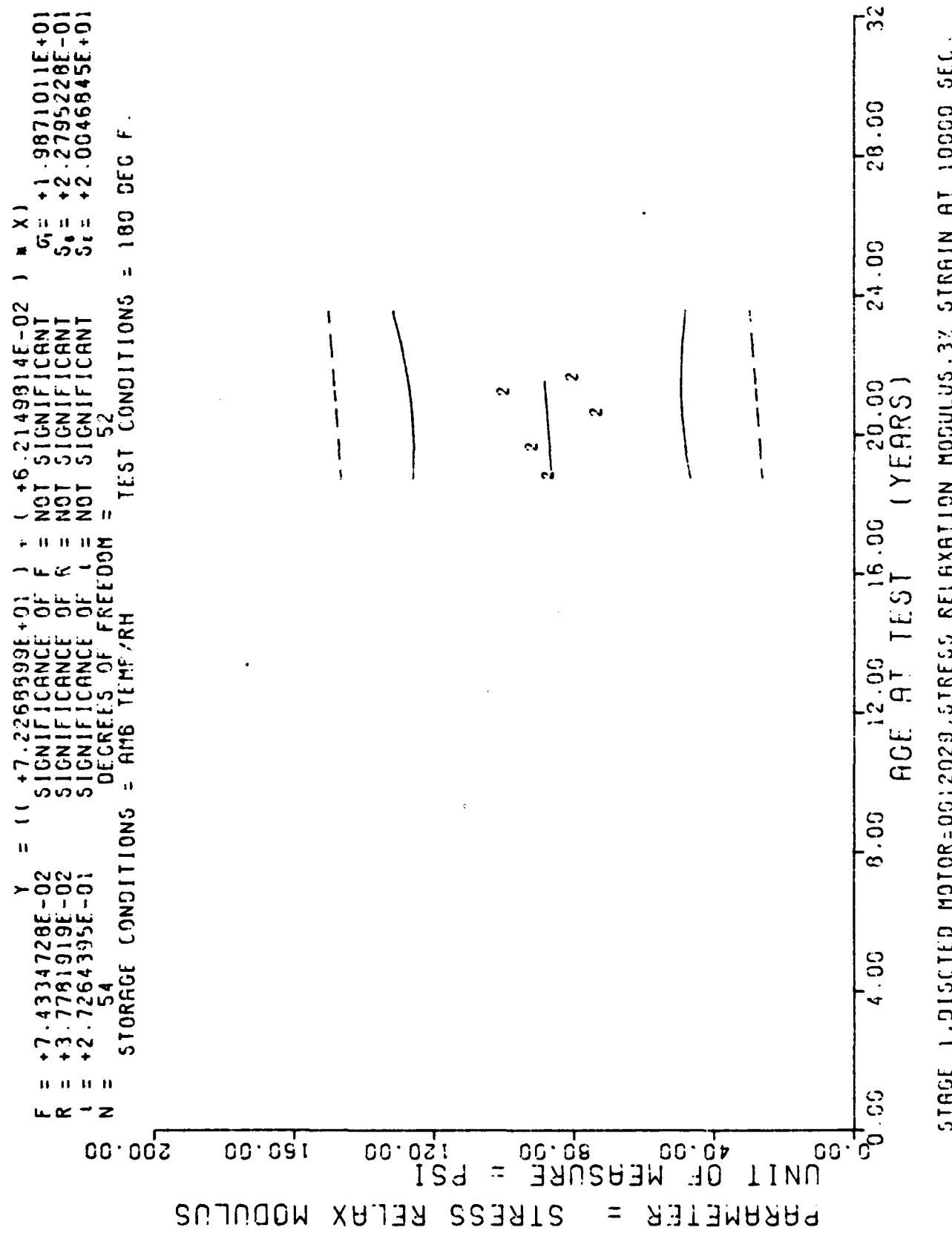


Figure 95

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIGATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
225.0	9	+8.588885E+01	+1.6251495E+01	+1.0700000E+02	+7.0000000E+01	+8.6252593E+01
235.0	9	+9.0666656E+01	+1.874586E+01	+1.2700000E+02	+7.0000000E+01	+8.6874099E+01
247.0	9	+7.2222213E+01	+6.4377359E+00	+8.0000000E+01	+6.0000000E+01	+8.7619889E+01
254.0	18	+9.6666656E+01	+1.8967464E+01	+1.3700000E+02	+7.0000000E+01	+8.8054946E+01
259.0	9	+7.9111099E+01	+2.3518314E+01	+1.2700000E+02	+5.7000000E+01	+8.8365692E+01

STAGE 1. DISCTED MATOR=0012029, STRESS RELAXATION MODULUS,3X STRAIN AT 10000 SEC.

$Y = 11.4897996E+01 + 1.9.9359689E+01 F + 1.1664497E-01 F^2$  \* X1 \* X2  
 $F = 1.4897996E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -5.0726180E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $R^2 = +3.8597922E+00$  SIGNIFICANCE OF R<sup>2</sup> = SIGNIFICANT  
 $N = 45$  DEGREES OF FREEDOM = 43  
 $STORAGE CONDITIONS = AMB TEMP/RH$  TEST CONDITIONS = 180 DEC F.

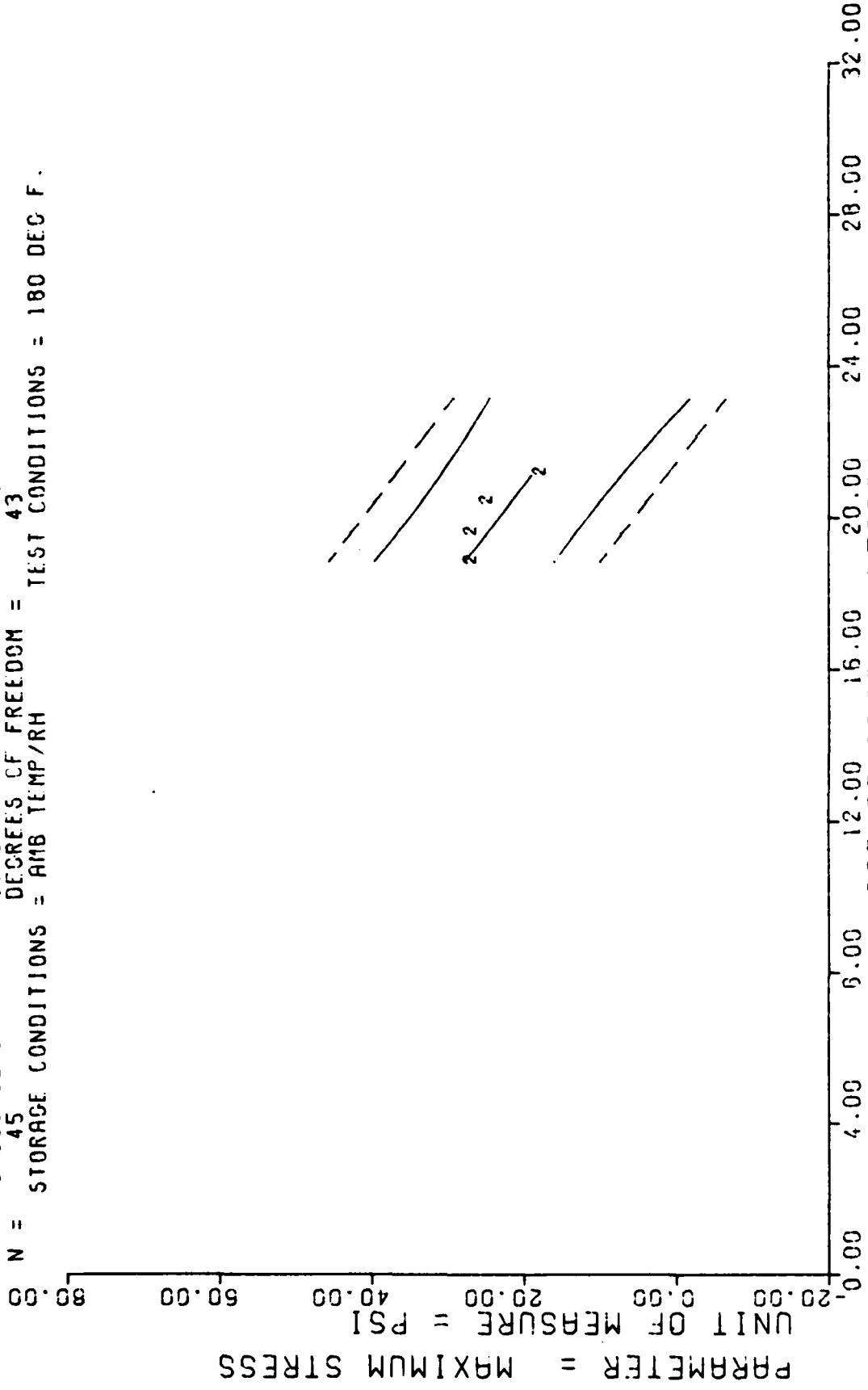


Figure 96

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIAION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
226.0	12	+2.06296786E+01	+3.6602412E+00	+3.0469585E+01	+1.0129989E+01	+2.7797912E+01
235.0	12	+2.0628621E+01	+3.5353646E+00	+3.0199596E+01	+1.9669998E+01	+2.4948120E+01
245.0	9	+2.0426548E+01	+1.1445650E+01	+5.0250000E+01	+1.0899999E+01	+2.1781661E+01
254.0	12	+1.7237487E+01	+1.5114957E+00	+1.5779598E+01	+1.3679999E+01	+1.8931854E+01

CASEB/C/C CONSTANT RATE TENSILE, STAGE 1 DISSECTED. CHS=.002

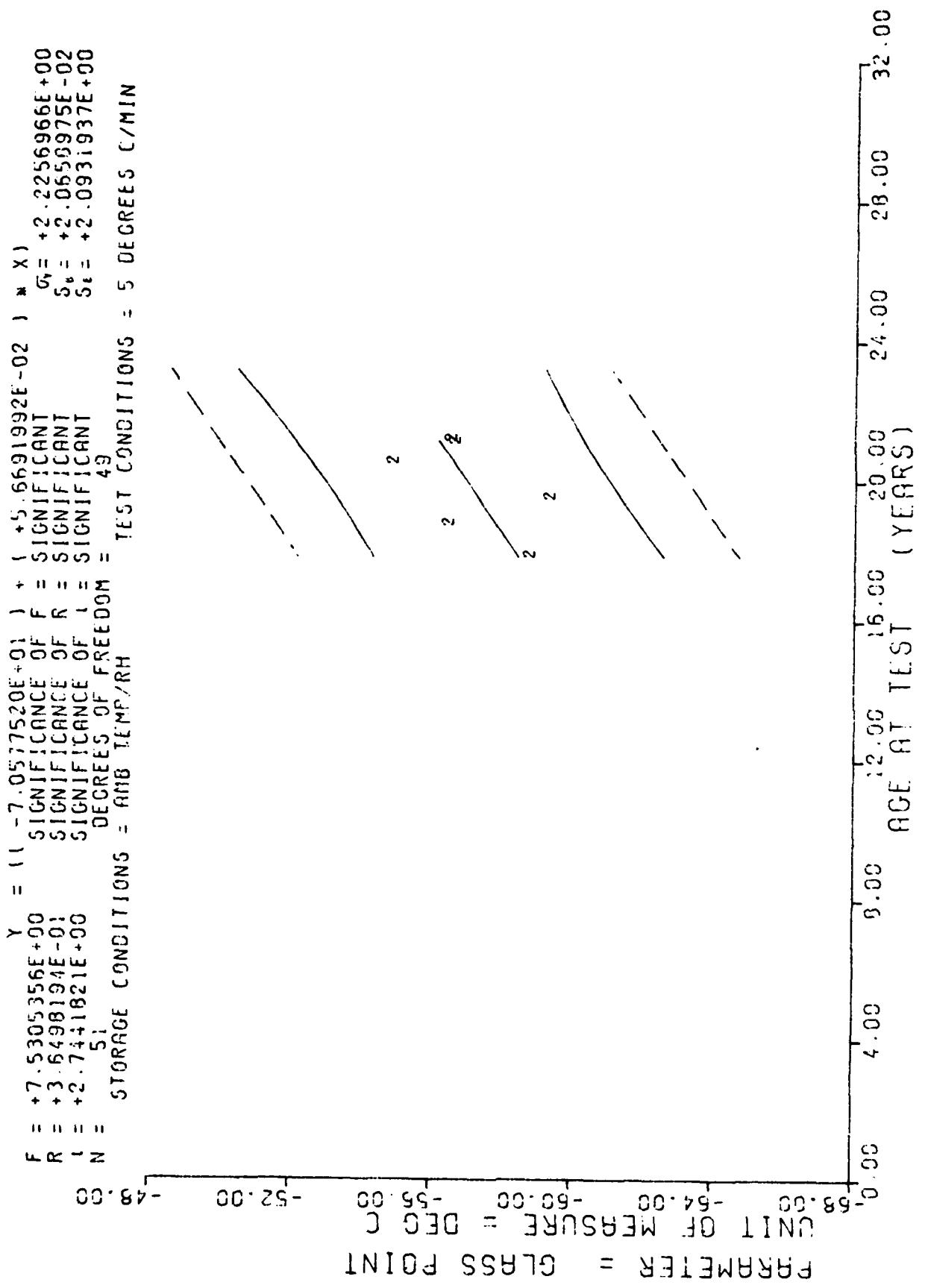


Figure 97

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
214.0	9	-5.0EEE2.385E+01	+1.7638342E+00	-5.7000000E+01	-6.3000000F+01	-5.8445419E+01
225.0	12	-5.6583328E+01	+2.3143164E+00	-5.3000000E+01	-6.2000000E+01	-5.7821867E+01
234.0	9	-5.9444442E+01	+1.4243036E+00	-5.7000000E+01	-6.1000000E+01	-5.7311584E+01
246.0	9	-5.5000000E+C1	+1.6533127E+00	-5.3000000E+01	-5.6000000E+01	-5.6631286F+01
253.0	9	-5.6777770E+01	+6.6666666E-01	-5.6000000F+01	-5.9000000F+01	-5.6274436F+01
254.0	3	-5.6666666E+01	+5.7715026E-01	-5.6000000E+01	-5.7090000F+01	-5.6177749E+01

DISSECTED ATR. STAGE 1, THERMAL COEFFICIENT OF LINEAR EXPANSION GLASS POINT

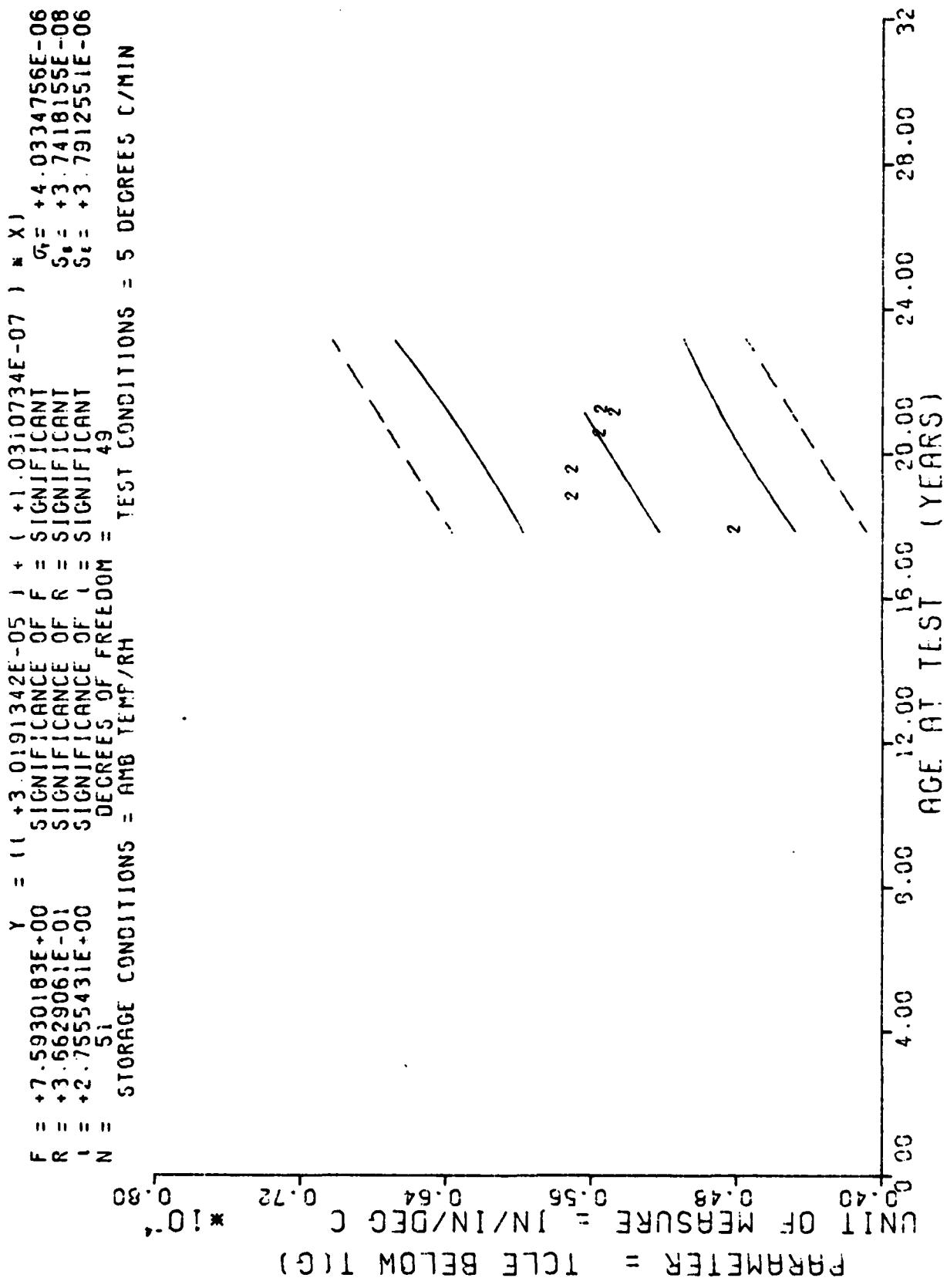


Figure 98

\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*

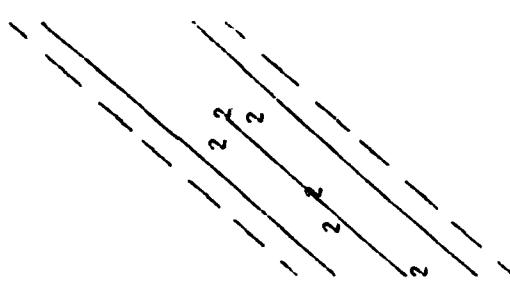
\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
214.0	9	+4.7866589E-05	+2.5809127E-06	+5.1599985E-05	+4.3699998E-05	+5.2256305E-05
225.0	12	+5.0783275E-05	+3.1553858E-06	+6.2199993E-05	+4.8299990E-05	+5.3390492E-05
234.0	9	+5.6755496E-05	+3.2020393E-06	+6.0299993E-05	+5.2199990E-05	+5.4319457E-05
246.0	9	+5.5244338E-05	+1.3766482E-06	+5.7399985E-05	+5.3299998E-05	+5.5555749E-05
253.0	9	+5.4422140E-05	+1.7426126E-06	+5.6499993E-05	+5.1699996E-05	+5.6277404E-05
254.0	3	+5.5166659E-05	+3.0858379E-06	+5.8699995E-05	+5.2999996E-05	+5.6380595E-05

DISSECTED MTR, STAGE 1. THERMAL COEFFICIENT OF LINEAR EXPANSION BELOW 76

$F = +1.6059066E+02$        $y = 11 - 1.5165934E-05$        $1 + 4.6043054E-07$        $1 + 4.6043054E-07$        $1 + 4.6043054E-07$        $1 + 4.6043054E-07$   
 $R = +8.7532840E-01$       SIGNIFICANCE OF  $F$  = SIGNIFICANT  
 $r = +1.2672042E+01$       SIGNIFICANCE OF  $R$  = SIGNIFICANT  
 $s = +1.2672042E+01$       SIGNIFICANCE OF  $r$  = SIGNIFICANT  
 $N = 5$       DEGREES OF FREEDOM = 49  
 STORAGE CONDITIONS = AMB TEMP/RH      TEST CONDITIONS = 5 DEGREES C/MIN

COUNT OF MEASURE = IN/IN/DEC C  
 $*10^3$   
 PARAMETER = TICLE ABOVE TG



0.00 4.00 8.00 12.00 16.00 20.00 24.00 28.00 32.00  
 AGE AT TEST (YEARS)

DISSECTED MTR, STAGE 1, THERMAL COEFFICIENT OF LINEAR EXPANSION ABOVE TG

Figure 99

\*\*\*\* LINEAR REGRESSION ANALYSIS \*\*\*\*

\*\*\* ANALYSIS OF TIME SERIES \*\*\*

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	PREGRESSION Y
214.0	9	+8.5477689E-05	+1.8628938E-06	+8.8999993E-05	+8.3099992E-05	+8.7646243E-05
225.0	12	+9.4758230E-05	+3.5020615E-06	+9.8195991E-05	+3.6099986E-05	+9.2930979E-05
234.0	9	+9.6677671E-05	+2.3469725E-06	+1.0079999E-04	+9.2999995E-05	+9.7254858E-05
246.0	9	+1.0689994E-04	+4.0425942E-06	+1.1539999E-04	+1.0229999E-04	+1.0302002E-04
253.0	9	+1.0296660E-04	+2.6859885E-06	+1.0709998E-04	+9.8999997E-05	+1.00638304E-04
254.0	3	+1.0639995E-04	+8.6062696E-07	+1.071998E-04	+1.054999AE-04	+1.0686347E-04

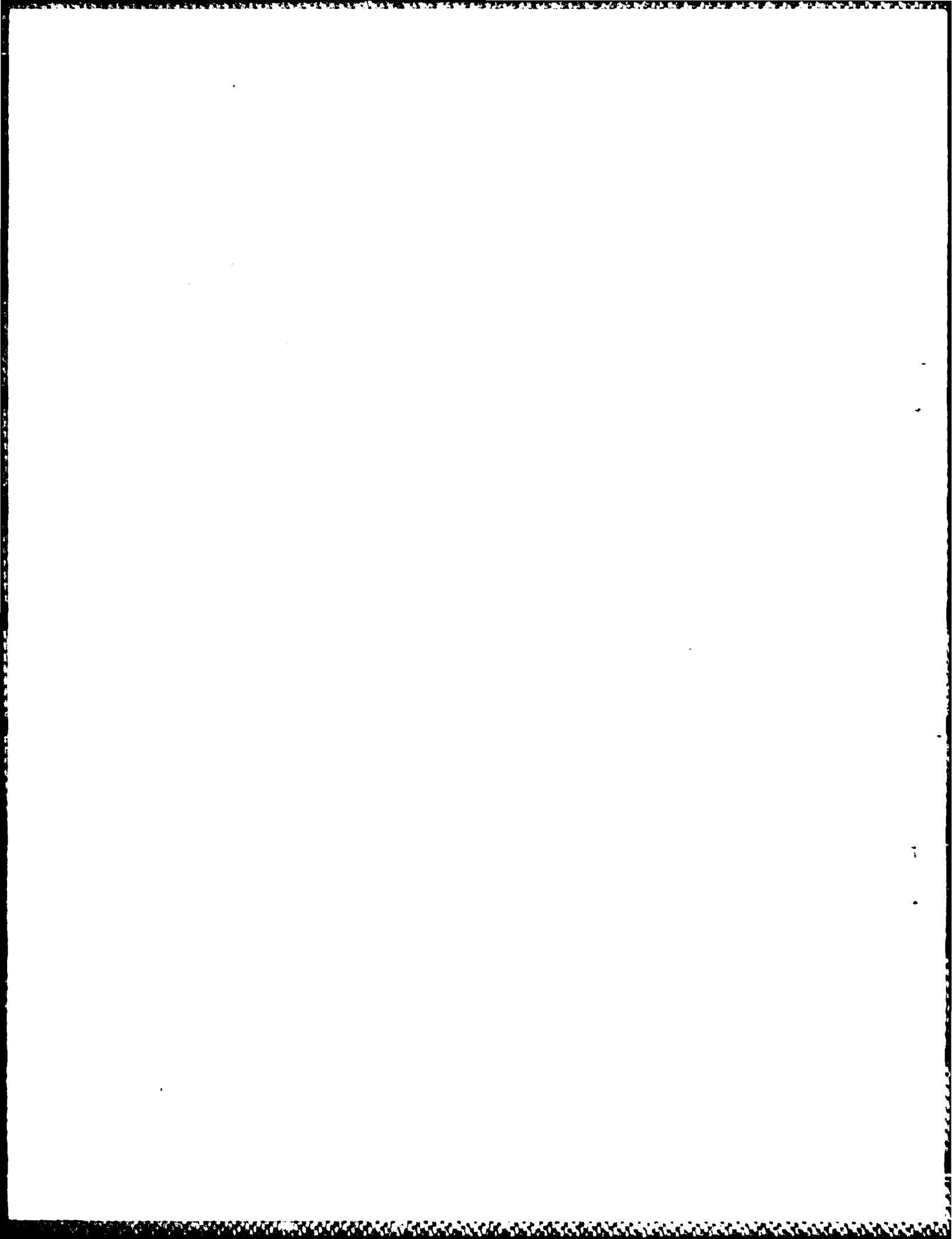
DISLECTED MTF, STAGE 1, THERMAL COEFFICIENT OF LINEAR EXPANSION ABOVE TG

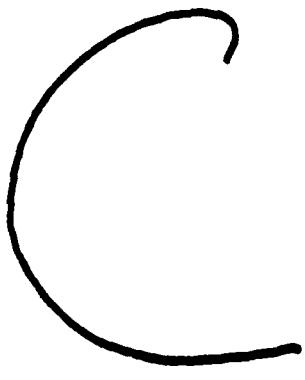
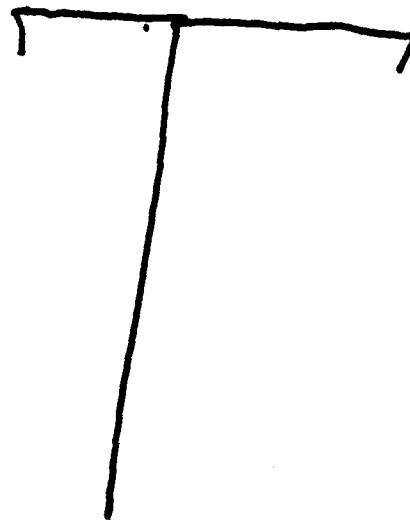
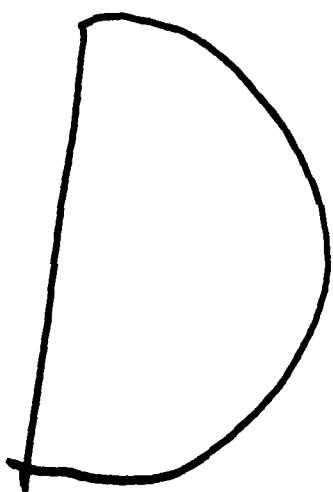
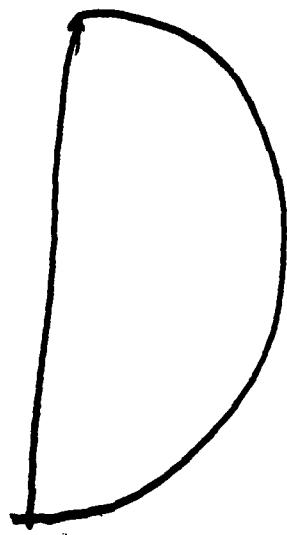
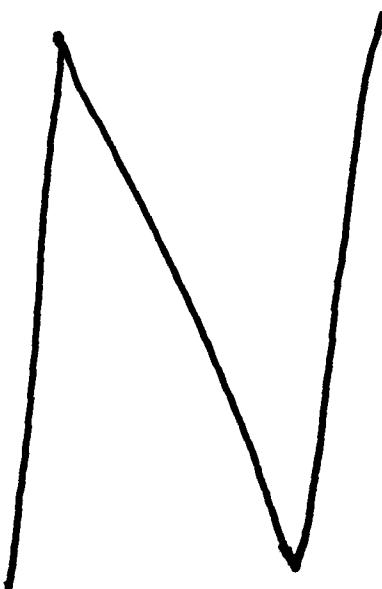
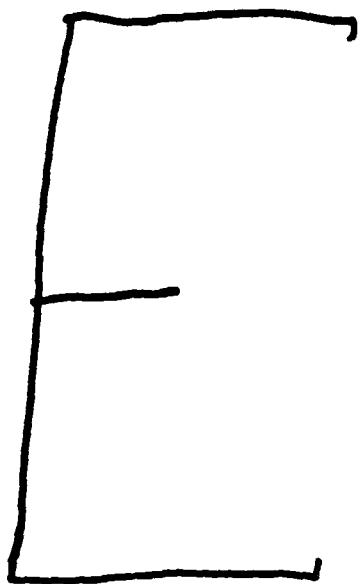
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		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s)		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS  <b>JOHN A. THOMPSON</b>		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS  <b>Propellant Analysis Laboratory Directorate of Maintenance Hill AFB, Utah 84056-5149</b>		12. REPORT DATE  <b>February 1986</b>
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)  <b>Service Engineering Division Directorate of Materiel Management Hill AFB, UT 84056-5149</b>		13. NUMBER OF PAGES  <b>225</b>
16. DISTRIBUTION STATEMENT (of this Report)  <b>Approved for Public Release Distribution Unlimited</b>		15. SECURITY CLASS. (of this report)  <b>Unclassified</b>
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)  <b>Minuteman Solid Propellant Dissected Motors</b>		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  <b>Testing was performed on First Stage Minuteman TP-H1011 propellant and case bond specimens from the dome end of motor S/N 0012029. This testing was performed to assure that deterioration in motor physical and thermal properties could be detected in time to take corrective action before the system performance deteriorated below an acceptable level. Testing was accomplished in accordance with MMRBA Project M34929C.</b>		
<b>From the analysis of the test results, the propellant and case bond properties have not deteriorated below an acceptable level at the present time and</b>		

for two years beyond the oldest data point

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